AUGUST, 1955

Products finishing

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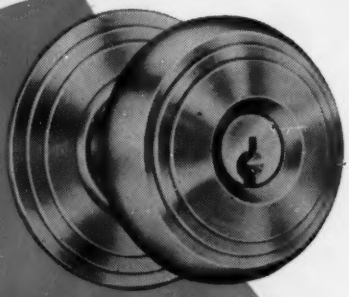
Finishes on *Metal* Products

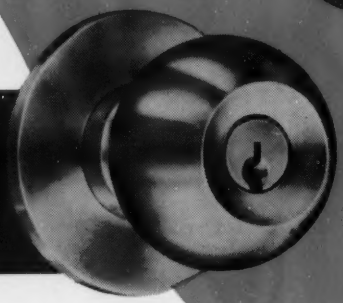
LEA

ATTRACTIVE
MODERN
DURABLE
ECONOMICAL

Satin Finish for



SCHLAGE NOVO
Satin Finished Wrought Bronze using Lea Compound 831.



SCHLAGE SATURN
Satin Finished Aluminum using Lea Compound 831.

SCHLAGE
LUSTER-SEALED
ALUMINUM LOCKS

Here's a beautiful line of modern locks . . . LEA SATIN FINISHED for consumer eye appeal. It's a finish that's economical to produce. It's a finish that's extremely durable in hard use. It's a finish that's modern. It may be just the finish for your product.

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Lea Mfg. Company of Canada, Ltd., 370 Victoria St., Toronto 2, Canada
Lea-Ronal, Inc., Main Office and Laboratory: 42-48 27th St., L.I.C. 1, N.Y.
Manufacturing Plant: 237 East Aurora St., Waterbury 20, Conn.

Please send additional information on the products shown on the following pages of this issue. (List page numbers and names of manufacturer.)

PRODUCTS FINISHING
AUGUST, 1955

Page No.	Name of Manufacturer	Page No.	Name of Manufacturer

COMPANY_____

CO. ADDRESS_____

CITY_____ ZONE____ STATE_____

NAME_____ TITLE_____

Your Monthly Source For Finishing Ideas

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AUGUST, 1955

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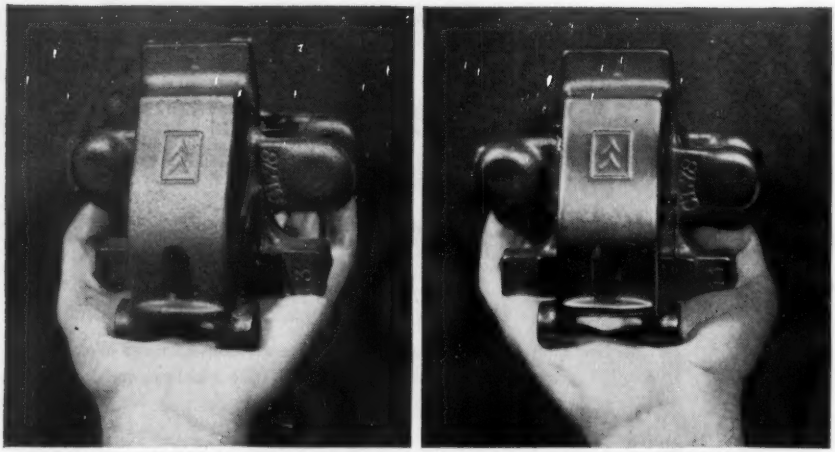

Identical castings, before and after barrel finishing with Norton ALUNDUM abrasive. Completely finishing this irregularly shaped part by hand would have taken much longer, with less uniform finishing of the many hard-to-reach spots.

ALUNDUM* tumbling abrasive tames another tough one!

Intricate parts finished faster, more thoroughly, when Norton abrasive adds the "TOUCH of GOLD"

The trickier, more intricate the parts, the easier it is to see the many advantages of barrel finishing with ALUNDUM tumbling abrasive. Hand finishing the casting illustrated, for example, would have been a long, tiresome chore — and an uneven job at best, due to the many irregularities of shape.

For parts ranging from even heftier castings down to tiny needles, there's nothing like ALUNDUM abrasive to bring out *all* the benefits of barrel finishing. This typical Norton abrasive development is sharp, dense, hard and non-fracturing. Its blocky shape eliminates slivers and chips in the tumbling process. In your tumbling barrels it assures:

- *Highest uniformity of radii and surfaces, with brightest, smoothest finish.*
- *Continual savings of man-hours, by reducing tumbling cycles, scrap and reworking to minimum.*

See Your Norton Distributor

for further facts on how ALUNDUM abrasive can add the time-saving, profit-boosting "Touch of Gold" to your finishing operations. Ask him for the new 55-page booklet on barrel finishing. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone book, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass. G 288

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with SUBMERGED CYLINDER

plates faster
reduces maintenance cost
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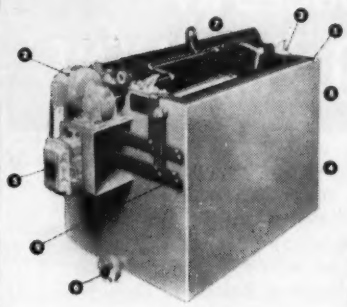
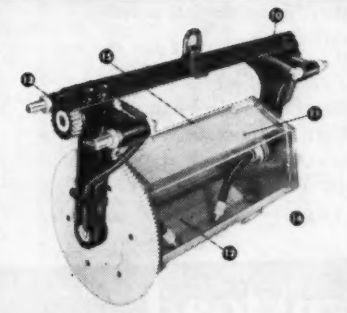


by combining *all* these features for better barrel plating:

1. **TURNED-IN FLANGES**—save space, provide enclosure for hanging heating and cooling coils.
2. **RELOCATED, MORE COMPACT MOTOR DRIVE**—drive shaft *now* above solution level, preventing leakage through shaft openings in tank walls.
3. **REDESIGNED SADDLES**—make barrel positioning far easier.
4. **NO OVERFLOW TROUGH**—not essential with this improved design, saves space inside tank.
5. **PUSH-BUTTON TYPE MOTOR STARTER**
6. **BOTTOM DRAIN**
7. **COIL RISERS**—extending over top of tank.
8. **ANODE RODS**—2 for each cylinder on both single and multiple units.
9. **BUS BARS**—positive and negative on *each* end of tank for equal current distribution.

These *improved* tanks are constructed of ¼" double-welded steel plate in 2 sizes, 14" x 30" I. D. (224 gal.) and 14" x 36" I. D. (252 gal.). For acid solutions, tanks are lined with ⅛" vulcanized rubber or plasticized PVC. For cyanide solutions, rough-wire glass is used in back of anodes. Finish is rust-resistant grey enamel with black trim.

TOGETHER, *They Form the Ideal Combination for Better Barrel Plating!*



10. **IMPROVED HANGER ASSEMBLY**—now made of rigid angle-iron, improved to insure proper barrel alignment.
11. **ONE-PIECE PANELS**—Plexiglas: ½" thick, no ribs. Melamine: ¼" thick, ribbed.
12. **CONVEX TUMBLING SURFACES (Plexiglas only)**—for added strength, easier tumbling action.
13. **MELAMINE BUSHINGS**—for insulating bronze hanger pins.
14. **EASY LOADING & UNLOADING**—cover with handle in panel area is easily reached at all times.
15. **SECURE BONDING**—all molded parts firmly bonded with cement and monel screws.

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For complete information on improved H-VW-M Mercil-Type Tanks and Cylinders ask for Bulletin PB 109.

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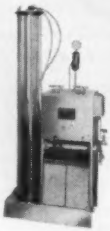
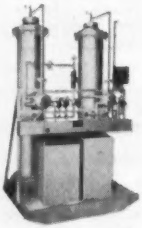
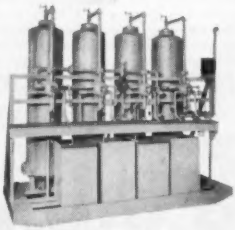


Mixed-Bed Model, 50 gal./hr. Others to 2500 gal./hr.



2-Bed Model, 200 to 1000 gal./hr.



4-Bed Model. 30 to 1000 gal./hr.

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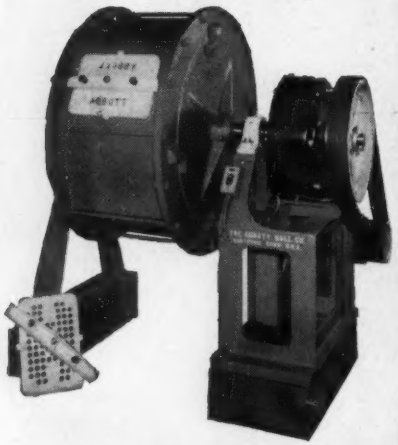
will do MOST of your BARREL FINISHING



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The Abbott Method — originated by The Abbott Ball Company in 1910 — features the famous Abbott Vertical Barrel and Abbott's scientifically designed Burnishing Shapes.

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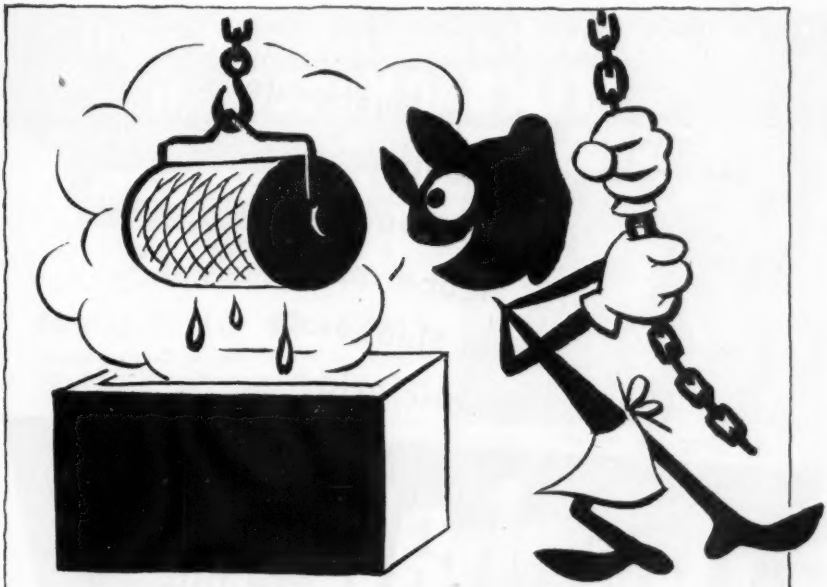

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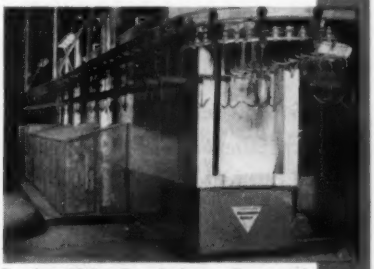

Bunting Glider Co., Ardmore, Pa., metal furniture makers, gets 4 times the production, no operating cost increases with this DESPATCH Conveyorized Washer and Dry-off Oven.

Atlas Mfg. Co., St. Paul, cuts labor costs 25% on furnace casings and boiler jackets with this DESPATCH FINISHING SYSTEM.

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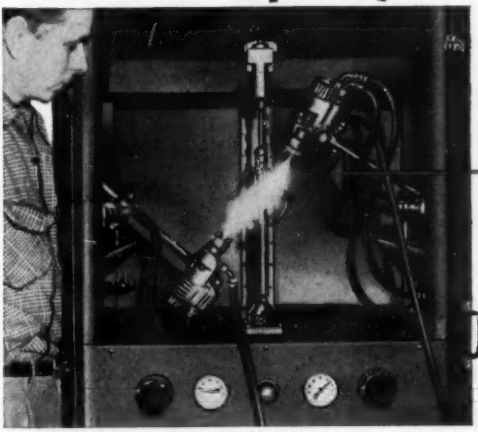

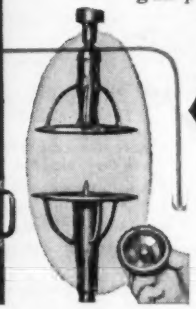

HOLD-DOWN pushes part into mask, or can be used for mask on top side.

EASY FEEDING of parts— always stops at same place, when the spindle stops rotating.

Experienced operators NOT required.

HOW IT WORKS: The operator loads the part, touches the foot valve— and the machine takes over: Automatically the hold-down grips the part, rotation starts, paint guns go on, then off, rotation stops, the hold-down releases.

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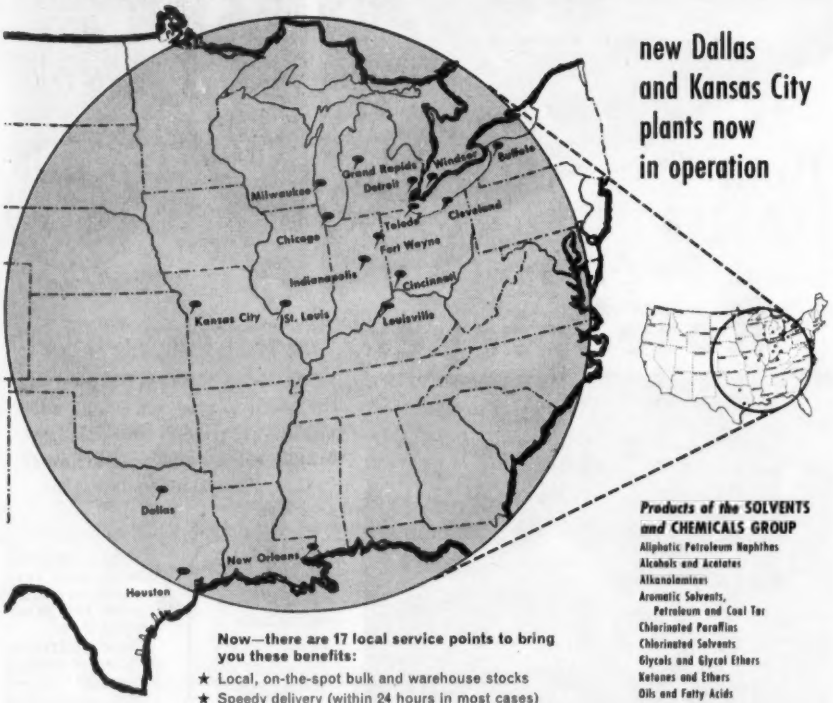

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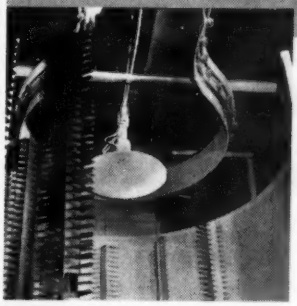

*Fluorescent Fixtures of California, in their modern plant in South San Francisco, uses the Ransburg No. 2 Process Reciprocating Disc Atomizer to paint their popular line of ALL-BRITE lighting fixtures. The quotes above are from Works Manager, R. H. Shaffer.

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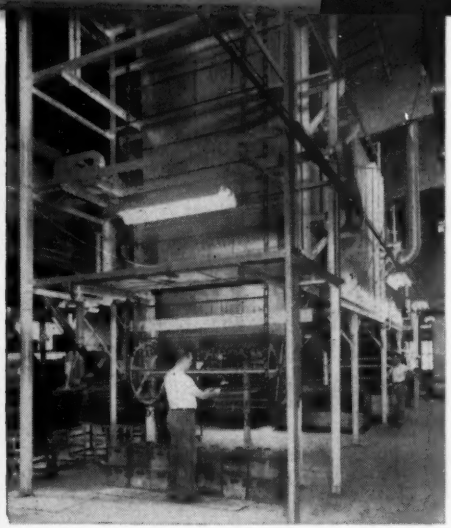
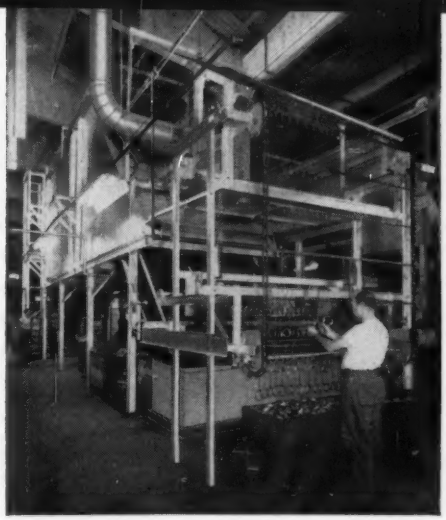


Charging end of finishing system. Parts dip quickly into paint tank then begin three passes through oven.



Unloading station. Note how oven utilizes ceiling space, leaving floor free for operators and storage.

Kirk & Blum Oven and Finishing Installation

INCREASES PRODUCTION 92%
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Before installation of this KIRK & BLUM system, maximum finishing production of small stampings and castings was 26,000 parts in 8 hours. Now, with the same operators, production is 50,000 parts in 8 hours. In addition, dip painting gives a better, more uniform finish and saves up to 82% of the paint formerly used in spraying.

This oven, despite its size, offers simple operation. Conveyor carries cross bars on selected centers up to 32 inches, depending on work size. The parts are loaded by the operator . . . dip into the caster-mounted interchangeable paint tanks, then make three horizontal passes inside the oven. Foamite fire protection is built-in.

The KIRK & BLUM Oven is direct gas fired, recirculating type, automatically controlled. The cycle can be varied from 1 to 2 hours. This speed control gives wide variation in the types of finishes which can be used.

This KIRK & BLUM installation is the ninth at this plant, ample evidence of complete satisfaction. Other installations include: 3 paint oven systems, fume exhaust system, 1 dust control system.

Whatever your industrial needs, consult KIRK & BLUM. Write for catalog on Industrial Ovens. The Kirk & Blum Mfg. Co., 3116 Forrer St., Cincinnati 9, Ohio.

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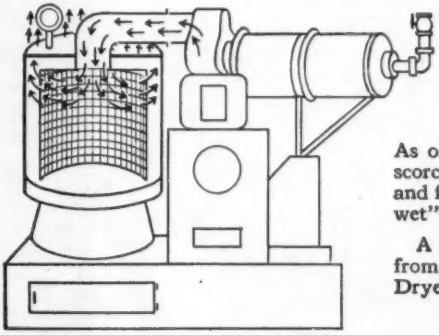

If you did, you saw a practical demonstration of the principle of air deflection. In old type dryers, air *blown* in from the top is deflected by the top layer of parts. As one user put it, "the top layer gets scorched, the next layer is nice and dry, and from there on down the parts are still wet".

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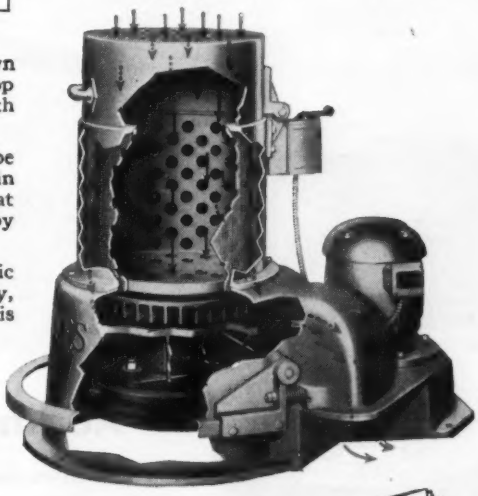
An internal expanding, hydraulic brake stops the machine smoothly, and quickly. The "brake pedal" is a ring extending around the entire working area so that the machine can be stopped instantly from any working position. In the interest of faster drying and lower costs write today!



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Vol. 19, No. 11

Guest Editorial

AUGUST, 1955

Hamburgers and Tomatoes

Every newspaper reader is probably now aware of the fact that the Navy has on hand sufficient canned hamburger to last that branch of the Armed Services for sixty years. This condition exists despite the fact that a Navy manual estimates the keeping life of canned meat at two years. Most of the supply is already unfit for use according to the manual. An unrealistic purchasing program to say the least!

This is only one of the glaring absurdities that occurs when the various branches of a government are permitted to operate without close over-all supervision. It is but one of many disturbing situations that has been unearthed by the Commission on Organization of the Executive Branch of the Government, which is headed by former President Herbert Hoover—conditions which largely developed under the bureaucracies established in time of war and permitted to continue after the emergencies were past.

For example, the Government creates and handles some 25,000,000,000 pieces of paper each year, exclusive of the tons of paper consumed in printing technical manuals, pamphlets, and periodicals. This paper work comprises over 1,000,000,000 individual letters, 9,000,000,000 documents, intended for Government permanent records, and 127,000 reports for Federal agencies. The cost of this paper work is $4,000,000,000 annually, and approximates the entire Federal budget prior to 1933. The full-time paper workers of the Government occupy an office space equal to that of thirty-six Empire State buildings.

Federal agencies have assumed the responsibility for the complete or partial health of over 30,000,000 persons at a cost of more than $4,000,000,000 annually. There are a considerable number of Federal hospitals operating in localities where private hospitals offer sufficient accommodations to meet all needs.

In the field of transportation, there are examples of inefficiency and careless disregard for costs. To cite one example, 25,000 pounds of cement were flown to Bermuda in September of last year and over 13,000 pounds of furniture in July. Why the rush? Of the 8,000,000 passengers flown in Department of Defense aircraft, approximately 4,800,000 were hitch hikers or on leave status. The Army sent 807,000 pounds of canned tomatoes from

California to New York, while the Navy shipped 775,000 pounds from the East to California. Ludicrous and costly!

These are but a few of the examples of waste and inefficiency in the reports being currently submitted to Congress by the Hoover Commission. In the interests of economy and tax relief, remedial legislation should be enacted without delay. But when people's jobs are at stake, even though they are obviously unnecessary, there is always a hue and cry from job-holders and their friends.

It is, therefore, of primary importance that every person genuinely interested in the welfare of the nation as a whole exert his influence in an effort to have Congress act favorably on the findings of the Hoover Commission. Letters addressed to individual Senators and Congressmen could lead to the saving of $6,000,000,000 through the elimination of waste in Government circles. In addition, approximately $7,000,000,000 in government funds now tied up in capital for wasteful projects could be returned to the Treasury Department for better use.

Charles O. Herb

—Editor, "Machinery" Magazine

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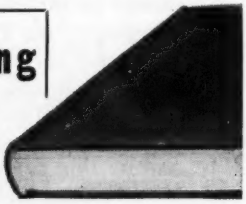
Bringing you Modern developments in plating processes and methods



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Plating Die Castings in

Three companies, all located in Wallaceburg, Ontario, Canada, cooperate to produce finished zinc base die castings for the automotive and plumbing industries. Castings are produced by Schultz Die Casting Co. of Canada, Ltd., copper, nickel, chromium, or gold plated by Sydenham Trading Co., Ltd., and painted or decorated by DeCedar Bros. All operations feature mechanized processes, the plating cycles being accomplished through use of transport conveyors and automatic plating equipment.

By EZRA A. BLOUNT
Editor

PF FEATURE

THE SCHULTZ DIE CASTING COMPANY OF CANADA, LTD., was founded in 1931 by the late A. St. Clair Gordon. The original plant has been expanded several times and now covers an area of over 50,000 square feet. The plant contains 22 die casting machines, some of which are said to be the most modern full automatics in the world — and the largest machines of their kind in Canada. The plant can produce more than 50,000 pounds of zinc base die castings daily.

These castings include automotive parts, marine hardware, counter and builders' hardware, plumbing fixtures, bathroom accessories, and highly accurate parts for general engineering uses. Some of these prod-

Fig. 1—Representative examples of die castings produced by Schultz Die Casting Company of Canada, Ltd., finished in chromium or gold, decorated with colored lacquer or enamel.

Conveyorized Plant

ucts are shown in Figure 1.

To make sure that the quality of the final finish was as good as the original die casting, a separate company—Sydenham Trading Co., Ltd. —was organized in 1938 to perform the plating operations. In 1946 the present half-million dollar building was completed (Fig. 2) and equipped with automatic buffing and plating equipment capable of producing 30,000 chromium plated parts each 9-hour shift.

Die Casting

Die castings are formed from New Jersey Zinc Zamac 3 alloy in the die casting machines located in the Schultz plant. Fig. 3 shows a Dodge fender ornament being removed from a die casting machine with a 42-inch face—one of the largest in Canada. Following the casting process flash must be cut from castings. Other operations performed include abrasive belt polishing, machining, drilling and tapping, deburring in dry tumbling barrels. All necessary manufacturing operations are followed by inspection and packing, either by shipment to the customer, or shipment to the nearby plant of Sydenham Trading Company for electroplating.

Polishing and Buffing

Die castings to be plated are received at Sydenham, scheduled for production, and routed immediately to the buffing and polishing department. Most die castings are of such a shape that a portion, if not all, of the surface can be buffed by automatic buffing machines (Fig. 4). For those castings that require hand buffing, a line of buffing lathes is provided (Fig. 5). Liquid buffing compound is used in automatic buffing, and stick compound for hand buffing.

Fig. 2—View of the plant of Sydenham Trading Co., Ltd., Wallaceburg, Ontario, which contains 30,000 square feet of floor space devoted primarily to finishing operations.

Plating Die Castings

Buffed die castings are inspected, racked on plating racks (Fig. 6), and transported to the plating department on an overhead monorail conveyor (Fig. 7) that connects the receiving and shipping area with the buffing, racking, plating, assembly and packing departments. Transport conveyor speed is 11 ft./min. Conveyor hooks are located on 2-foot centers. Rack and casting weight does not exceed 15 pounds, this being the weight on each conveyor hanger. This represents a surface area for plating of about 2 to 3 square feet.

This conveyor acts as an effective production control pace setter, provides storage for parts in process so that they do not take up floor space and obstruct smooth operation, and delivers an even flow of in-process parts to the next operation, as well as delivering a pre-determined quantity of plated parts to the assembly and packing area. It is the keystone that ties together all the related automatic and semi-automatic finishing processes.

Barrel Finishing

Certain die castings lend themselves, either by their finish specifications or their end uses, to a barrel finishing treatment prior to plating or paint finishing. This is accomplished, after the parting lines are removed, on 220 emery abrasive belts, in Grav-I-Flo barrels (Fig. 8). As can be noted on the photo, each

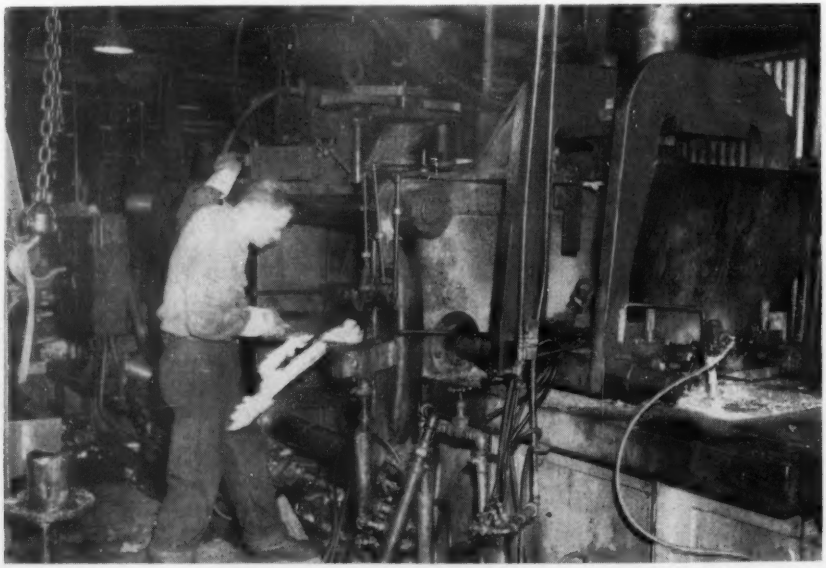

Fig. 3—One of the die casting machines which produce the products plated at Sydenham. This machine has just opened, and the operator is removing the formed die casting.

barrel can be loaded with a large quantity of the die castings. The finishing process consists of a varying time cycle grind (4-24 hrs.) using chips and a barrel finishing compound. After a good series of rinses a coloring compound is added, and a 2-hour coloring treatment produces a bright surface on the parts. The castings are washed and dried, after which they may be plated or painted as their finish specifications require.

Plating

When racks of buffed parts reach the plating department on the transport conveyor, they have been degreased by a Royalene spray-vapor degreaser through which the conveyor passes. They are unloaded and processed through an automatic

Fig. 4—Die castings are buffed automatically on Acme "push-in" stand using J. C. Miller liquid buffing compound.

Fig. 5—Those parts, whose shape and design make hand buffing operations necessary, are buffed on buffing lathes fitted with buffs shaped as required by the part.

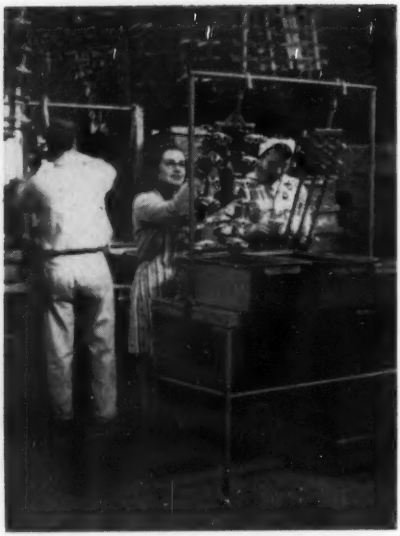

Fig. 6—Buffed parts are inspected during racking and are not racked for plating if they require further buffing or have defects.

cleaning and copper flash plating machine. The steps in this automatic cycle are:

1. Clean for 3 minutes in Northwest emulsion soak cleaner held at 140 deg. F.
2. Warm water rinse.
3. Electroclean anodically for 20 seconds in Northwest No. 30 (7 oz./gal.) held at 145-155 deg. F.
4. Warm water rinse.
5. Dip in 0.5 per cent sulfuric acid.
6. Water rinse.
7. Cyanide copper flash for 1¾ minutes in a Rocheltex copper solution.
8. Warm water rinse.
9. Dip in 0.5 per cent sulfuric acid.
10. Rinse in cold water.

After cleaned and copper flashed

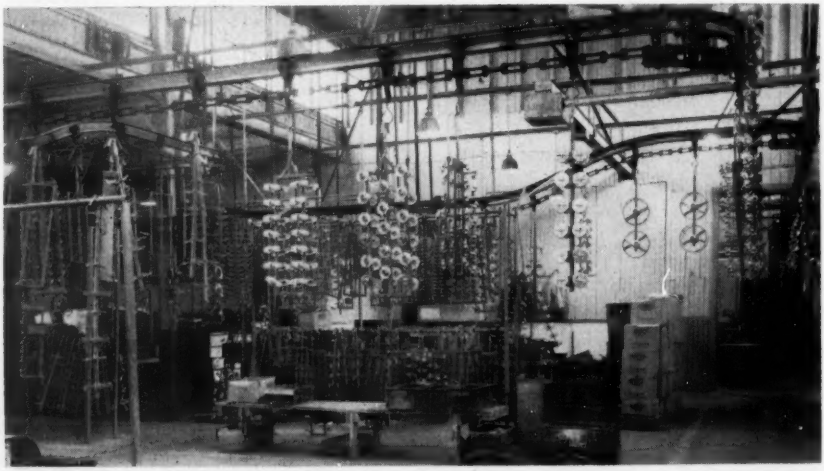

Fig. 7—Moving at 11 ft./min., this transport conveyor, which connects receiving and shipping centers with other departments, carries racked parts to the plating department.

parts are thoroughly rinsed in cold water, the racks are placed in the 35-foot semi-automatic copper plating machine (Fig. 9). A 0.0003 to 0.0005-inch copper plate is deposited during the 12-13 minute cycle. A Unichrome Pyrophosphate Copper bath operated at 140 deg. F. in the 5000-gallon rubber lined tank accomplishes this copper plating operation. Air agitation keeps the solution uniform as to temperature and composition so that a smooth, uniform plate will be deposited.

Following the completion of the copper plating cycle, racks of parts receive a concentration or dragout water rinse, a dip in 3 per cent sulfuric acid, and a water rinse before being transferred to one of the bright nickel tanks located adjacent to the copper semi-automatic. In the 5000-gallon semi-automatic bright nickel tank shown in Fig. 10, a 24-minute plating cycle produces a nickel plate 0.0007 to 0.001-inch thick. The Unichrome Bright Nickel solution is operated at 140 deg. F. and a pH of 3.5. Plating takes place at a current density of 40 to 60 a.s.f. The other semi-automatic bright nickel tank also contains 2700 gallons of Unichrome Bright Nickel solution. (This solution is operated at 135 deg. F., with other operating variables being the same as for the other bright nickel tank.)

Nickel plated parts receive a dragout rinse and a thorough running water rinse prior to either gold or chromium plating. Nickel plated parts to be gold plated are plated for 15 seconds in a Technic gold plating solution (Fig. 11), dragout rinsed, cold and hot water rinsed, and

Fig. 8—Some of the die castings are barrel finished in quantity prior to plating or painting in three barrel finishing machines.

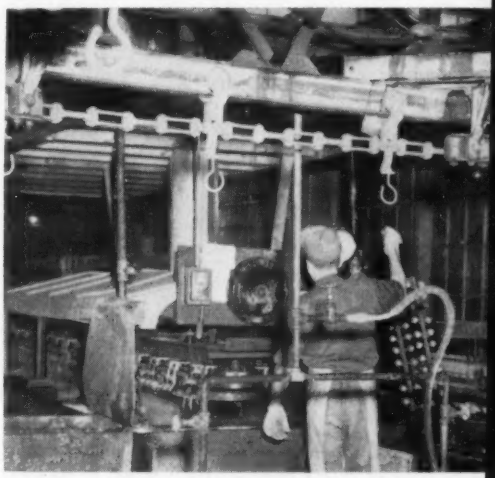

Fig. 9—One operator loads and unloads parts from Unichrome copper plating machine.

hung on the transport conveyor to be routed to the unracking, assembly and packing area.

Nickel plated parts to be chromium plated are hung on the Lasalco semi-automatic chromium plating machine (Figs. 12 and 13). The cleaning and plating process for this cycle is as follows:

1. Clean and activate cathodically for 20 seconds in a solution of 10 oz./gal. Northwest No. 47, 7 oz./gal. sodium cyanide at 150 deg. F. (Fig. 12). Current, 150 amp./rack.
2. Water spray rinse (Fig. 12).
3. Dip in a 5 per cent solution of sulfuric acid containing 2 per cent Northwest Acid Addition Agent No. 1. This dip aids in chrome coverage.
4. Water spray rinse.
5. Chromium plate for 1¼ minutes in a Unichrome S R H S CR-110 chromium plating solution. Solution temperature is controlled automatically.
6. Concentration or dragout rinse.
7. Agitated water rinse.
8. Agitated water rinse. This water is circulated back to the other rinse tank (Step 7) to conserve water.

The plated parts remain on the plating conveyor and return to the starting point to be transferred to the transport conveyor, and routed to the inspection and final assembly de-

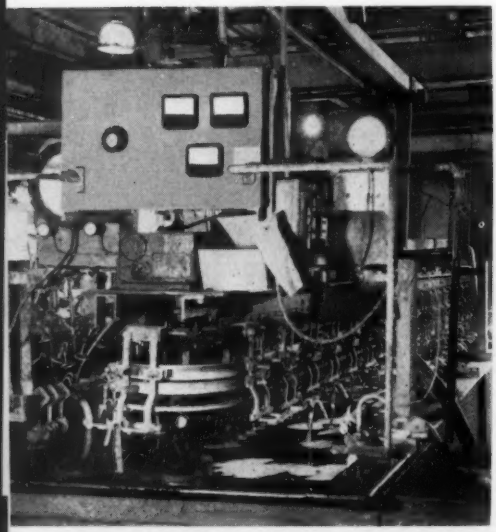

Fig. 10—At the loading and unloading station on the semi-automatic bright nickel plating machine are located the current controls and recording charts for the automatic temperature controlling devices in use.

Fig. 11—Some automotive hub cap ornaments receive a gold plate after being copper and nickel plated. They are then routed to packing and shipping, or to another location for the application of lacquer.

"Plating operations are so carefully controlled . . . that almost no chrome buffing is required."

partments. While in transit on the transport conveyor, they receive a hot water rinse and are dried, so that they arrive at the inspection station dry and ready for unracking, inspection, assembly, or packing. Plating operations are so carefully controlled and racks designed so well that almost no chrome buffing is required.

Sydenham has 30,000 sq. ft. of floor space. Eight generators produce a total of 26,000 amperes at 6 volts and one rectifier produces 4,500 amperes at 9 volts. Facilities are available for the barrel zinc plating of iron and steel parts, and the application of chromate conversion coatings on zinc die castings. Such coatings increase corrosion resistance of the casting and serve as a good paint base.

Plating Solution Control and Maintenance

Sydenham plating practices feature close control of temperature and regular, adequate solution treatment. Automatic temperature controls are used to regulate temperatures and ensure efficient use of process steam. A nickel plated heating coil is used in the bright copper tank to secure the proper operating temperature.

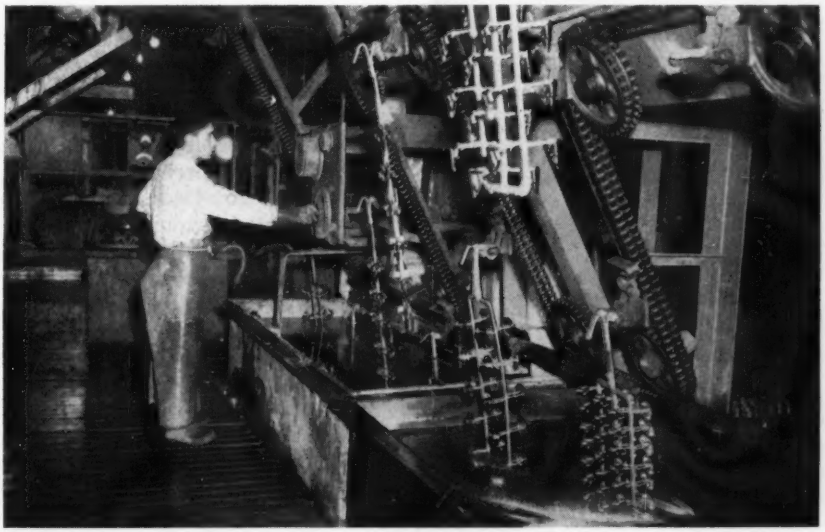

Fig. 12—First step in the semi-automatic chromium plating cycle is activation in N. W. No. 47 solution. Operator hangs racks of bright nickel plated parts on the chromium plating conveyor for processing through the cycle. Racks of plated parts return to this station to be removed from chromium plating conveyor. They are then hung on transport conveyor to be moved to the final inspection area for inspection, packing and shipping.

"Increased life is obtained from the plating rack coating by applying it over plastic tubing . . ."

Filtration of the pyrophosphate copper solution and the nickel solutions is carried out continuously using Industrial filters. The copper solution is purified regularly to remove organic impurities. The bright nickel solutions are operated regularly at low current density (dummied) to remove zinc impurities. Other standard maintenance procedures which represent good practice are used.

Standard plating racks are purchased when possible. However, special racks are constructed in the Sydenham plant so that production on new orders and products can be initiated promptly. In the same department, production racks are repaired and re-insulated when necessary.

Unichrome 218X rack coating is used to insulate plating racks. Increased life is obtained from the plating rack coating by applying it over plastic tubing which is run onto the rack members prior to the application of Unichrome 218X.

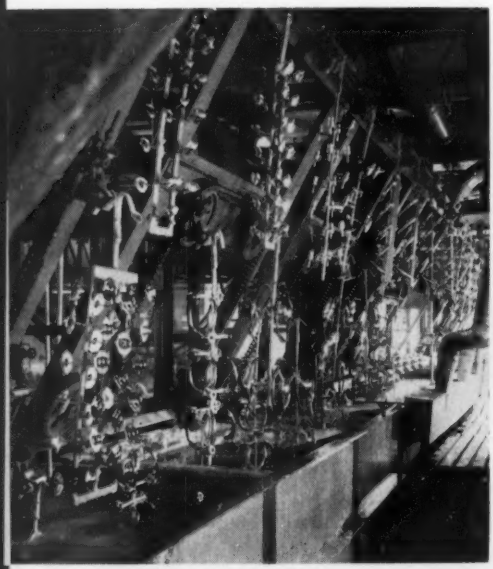

Fig. 13—Overall view of the chromium plating machine showing how the conveyor transports racks of parts through the various solutions, and returns completed parts to the loading and unloading station. Section of conveyor at top of photograph is the return section.

Paint Finishing

Many plated automotive die cast parts are trimmed with lacquer or enamel coatings. A wide variety of other die cast products receive paint coatings only, after being degreased and treated with a dichromate dip to prevent corrosion and increase paint adhesion. Such spray painting operations are performed in the plant of DeCedar Bros., located near the two plants previously mentioned. Spray painting is performed in a dry-type spray booth, or a water wash booth, according to the nature of the material being sprayed. Figure 14 is a view of the dry spray booth used for decorating plated automotive trim. Fiber filter units located in the rear of the booth remove overspray paint from the exhaust air. Painted parts (spray decorated by means of spray masks) are placed on the wire mesh conveyor shown in the left foreground to be conveyed through an infra-red oven for drying or baking the paint finish. At the other end of the conveyor, the paint-

ed, dried, parts are unloaded and packed for shipment.

Parts which receive a paint coating only are usually sprayed with a baking enamel in the water wash spray booth shown in Fig. 15. The painted parts are placed on one of two conveyors which carry them through infra-red ovens so that the paint finish will bake to form an attractive, durable film. Figure 16 shows the unloading end of the conveyorized baking ovens, where the finished products are unloaded and packed for shipment.

Articles spray finished at DeCedar Bros. include automotive trim, control knobs, panels, flashlight cases, pencil sharpeners bases, hinges, pressure fruit juicers, multicolored nameplates and medallions, oil burner units.

Quality Control

Bathroom equipment made by Schultz and plated by Sydenham is identified by the phrase "Lifetime Chrome." This is indicative of the quality built into each product leaving the plant.

Finishes are inspected carefully in several stages of each finishing process to be sure that quality standards are being met. In a like manner, the chemical control laboratory checks the various finishing processes to be certain that operating conditions are being maintained at the proper points. Naturally, an organization that is so insistent on finish quality is equally active in investigating the possibilities of new finishing processes and methods that will make possible better products at the same or lower cost. However, before adopting any new method, the company

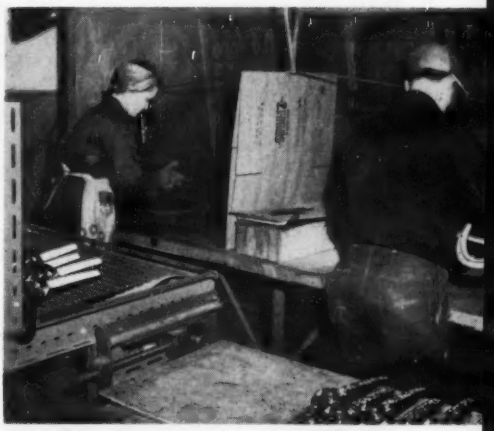

Fig. 14—Chromium plated automotive parts are sprayed with contrasting white baking enamel and placed on conveyor for drying in infra-red oven. Booth is dry type.

Fig. 15—Oil burner unit bodies receive a coat of baking enamel in a water wash spray booth in the DeCedar Bros. plant. Operator on the right has just finished spraying a part and is placing it on the baking conveyor. Note how a masking device to keep paint out of the part openings has been designed so that it serves also as a handling rack.

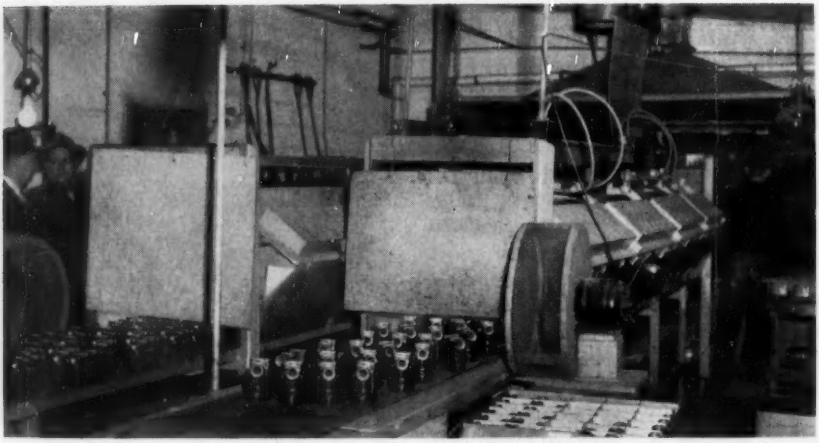

Fig. 16—Overall view of one spraying and baking installation showing spray finished oil burner units emerging from the infra-red baking oven to be unloaded and packed for shipment. (Photographs used as Figures 2, 6, 10, 13 were supplied by the Sydenham Trading Company, Ltd. Other illustrations are PRODUCTS FINISHING staff photographs.)

management insists on thorough laboratory and pilot plant tests before making changes in a system already producing satisfactory results.

★ ★ ★

1954 Supplements to Book of ASTM Standards. Published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. The 1954 Supplements, issued in seven parts, give, in their latest form, 415 specifications, tests, and definitions which either were issued for the first time in 1954 or revised since their appearance in the 1952 Book or 1953 Supplements. Price, $3.50 per part; $24.50 per set.

These supplements are issued every year for each of the seven parts of the Book;

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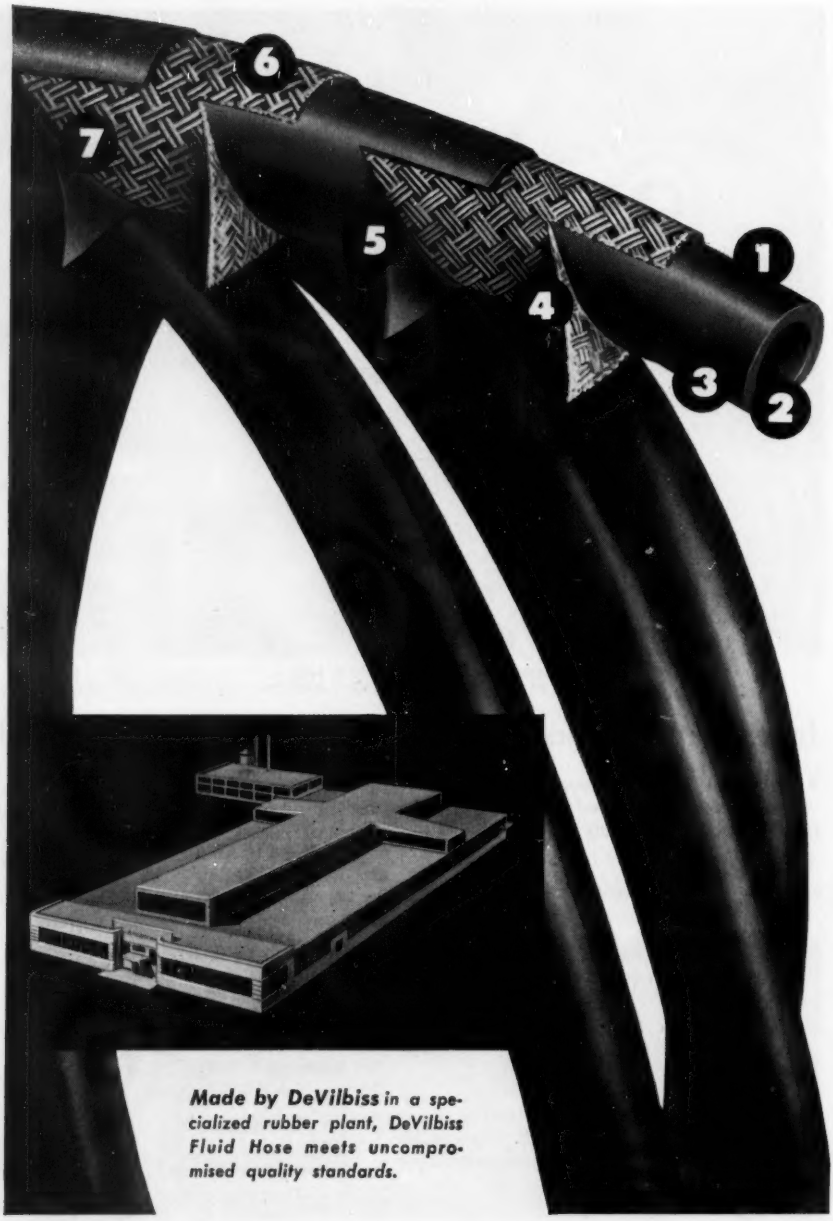

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How Good A Boss Are You?

In this article, the author develops a practical 11-point supervisory check sheet—by which foremen and office managers may evaluate roughly the quality of their own supervision.

By ALFRED M. COOPER

IN SHOP, FIELD AND OFFICE, the quality of supervision has improved steadily, yet every survey of employee attitude appears to indicate there is room for further improvement. Most peeves which the workers register against their companies today have to do with irritating contacts they have had with an immediate supervisor. Granting that certain of these complaints have no basis in fact, it is important that the key man get results without creating discord.

With this in mind it may be interesting for the supervisor to study the following questions and comments as a check on the efficacy of his efforts to direct the activities of others. Each point listed was suggested by an executive of broad experience, and considered by him to be important. The man who is yet to be promoted to supervisory rank likewise may profit by thus analyzing his capacities for successful supervision.

1. Can you plan your work ahead?

No supervisor can schedule his time and energies to best advantage until he knows exactly what he is responsible for and has analyzed his job in terms of the relative importance of his responsibilies. Experience proves that until the supervisor gives real thought to this matter of analysis there is an excellent possibility that some of his responsibilities are being slighted, while it is not uncommon to find routine or emergency responsibilities that appear to belong to no one, or which are apparently the responsibility of two or three supervisors.

Such hiatuses or overlapping can be eliminated if each supervisor analyzes his own job and establishes, from experience, a scale of importance for such common responsibilities as getting out production, development of morale, employee physical condition, records and reports, and so on. It is then not difficult for the supervisor to allot approximately the proper time and energy to the discharge of each responsibility, in terms of its importance *in that particular department,* and thereafter know that his planned work schedule

11 POINTS FOR CHECKING YOUR SUPERVISORY QUALITIES . . .

will make his supervision both well-balanced and complete. No one but the supervisor can make a proper analysis of his own responsibilities.

2. *Do you like your subordinates?*

It has always been conceded that a supervisor, to be successful, must win the liking of those reporting to him. But this in itself is not enough. *Experienced executives contend it is difficult to establish a proper boss-worker relationship unless the supervisor genuinely likes a majority of his subordinates.*

Conceivably, a supervisor who was meticulously fair in his treatment of all subordinates might avoid serious friction, even though he was concealing his dislike of these people. Judicial fairness is difficult of attainment and probably impossible for the Old Scrooge we are discussing. On the other hand, a supervisor who likes those reporting to him may well be excused by his subordinates for occasional lapses in this respect. On occasion, a supervisor may find it advisable to make changes in the personnel of his department, should he find himself saddled with too many individuals who could not learn to react well to friendly supervision.

3. *Are your orders obeyed promptly and fully?*

In analyzing their own jobs, foremen and office supervisors usually are altogether realistic. *They agree, for example, that their primary responsibility is that of getting out production. Unless they can meet this obligation, they contend, there is an excellent chance they will be replaced.*

"Such . . . overlapping can be eliminated if each supervisor analyzes his own job . . . "

Since, in any department, the giving of orders and the manner in which these are carried out have a lot to do with getting out produc-

". . . it is difficult to establish a proper boss-worker relationship unless the supervisor genuinely likes a majority of his subordinates."

". . . ability to apply motivation properly distinguishes the leader of men from the driver."

tion, a check must be made here. The speed and effectiveness with which orders were obeyed may at one time have indicated the degree of fear entertained by the workman for his boss. Nowadays these are likely to indicate the confidence of the worker in the fairness, job knowledge, and judgment of his foreman. Such confidence can be based only on experience, which has demonstrated that the boss's orders are likely to be reasonable, are never arbitrary and may well be obeyed promptly, and as given.

Where subordinates feel justified in questioning any order before carrying it out, there is something wrong. This is no time for instruction. For one thing, the time element may well make it impossible to explain why any order has been given, and such explanation should never be essential to prompt action on the part of a subordinate when an order has been issued.

The supervisor who is having difficulty getting his orders obeyed as given will do well to check the degree of forcefulness with which his oral orders are issued, and also should determine by a mental check that the who-when-what-where elements of a proper order are either explicit or implicit in the wording of any order.

4. Do you know how to make people do what you want them to do?

Educators call this motivation, but it has been practiced in all human relations for ages. Wives are especially good at it. It is the essence of good salesmanship. Its application gets things done smoothly and apparently effortlessly. The ability to apply this motivation properly distinguishes the leader of men from the driver.

The boss who can make a subordinate's job interesting to him, and who knows how to make that job important in the eyes of the worker, will have little trouble in sufficiently motivating those reporting to him. The boss wants adequate production of good quality, and this is exactly what the subordinate wants to turn out if he is being properly supervised.

A supervisor can make a job interesting by giving credit for good work, by removing unnecessary an-

". . . their primary responsibility is that of getting out production . . . or there is an excellent chance that they will be replaced."

noyances, by checking the worker's physical capacities and by reducing accident rates. It is quite possible to overdo motivation. Employees may get fed up with too frequent and too obvious efforts to spur them on to greater exertion by the application of motivation in one form or another. For example, comparison of production records in like departments or plants may have value as an incentive factor, but this is true only when such motivation has not been worked to death.

5. Do you know when and how to deliver an effective reprimand?

Any consideration of supervisory procedure that does not cover the when and how of reprimanding must be wholly unrealistic. Should the day ever come when all orders are carried out promptly and exactly as given, then the supervisor can forget about reprimands. Until then, he will do well to study his methods of calling attention to oversights in these matters. For years emphasis has been placed on doing all reprimanding in private, and most supervisors subscribe to this.

The objective will be to make the reprimand sufficiently effective with each individual so that it will be a long time before another one is necessary. Experienced executives contend that the reprimand must be fitted to the individual; that a few words will suffice with an intelligent subordinate, but more time and effort must be devoted to the obtuse or stubborn worker. The desideratum here is that, when the reprimand has been completed, the employee knows exactly why he has been corrected, holds no resentment, but feels inclined to avoid further errors in the future. Thereafter there must be no carryover of censorious attitude on the supervisor's part.

"Soft supervision," of the sort which is practiced by those who believe reprimands are never called for, is ineffective, costly supervision. We saw too much of this sort of thing in our industries during World War II.

Educators call this motivation. It has been practiced in all human relations for ages. Wives are especially good at it.

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11 Points for Checking Your Supervisory Qualities

When consistently practiced it places a premium on sloppy workmanship and develops a curious and unpleasant type of prima donna subordinate — a person something like the "little monsters" we see among the children of parents who refuse to correct their progeny for fear of inflicting a "psychic wound."

A supervisor should never be put in the position of being shorn of too much of his rightful authority, for then he must attempt to get results by wheedling, wasteful, roundabout methods of persuasion in which polite suggestions must replace the issuance and following up of result-getting orders.

6. How much responsibility are you willing to assume if a subordinate of yours is injured on the job?

In this matter of the supervisor's responsibility for injury there is, of course, no set rule to determine when the head man is at fault. *Some authorities contend that, if he has a say as to who goes to work in his department, and is permitted to train these people, he is always responsible.* Others believe he is responsible for all injuries, except those that are demonstrably unpredictable — a difficult rule to apply in practice.

". . . if he has a say as to who works in his department . . . he is always responsible."

The important thing here is not the technical degree of responsibility for accident prevention that may be assigned to the foreman, but rather the readiness of the supervisor to shoulder such responsibility. If accidents were desirable there would be no problem here, but a supervisor may be censored for having too many of these in his department, and in some plants I have known of a foreman being allowed, say, three serious injuries within a year's time among his subordinates, after which he was relieved from duty.

Thus, the foreman who accepts responsibility for accident prevention demonstrates genuine awareness of his unique on-the-job relationship with his subordinates, wherein he can combine daily safety instruction with routine production supervision.

7. Do you consider your brother supervisors to be high-grade men?

It is not reasonable to expect any supervisor to entertain a high opinion of all his brother supervisors. But in the average industrial organization a majority of the supervisors should measure up to certain minimum standards in the qualities of supervision we are considering.

Therefore, if the supervisor gives all his fellow-bosses blanket high praise he probably is not being altogether sincere. In the give-and-take of production supervision it is inevitable that some friction will de-

velop, and this must in some degree color the opinions supervisors entertain toward one another.

In some instances the fact that a group of foremen are in competition for the job ahead may lead a short-sighted individual to take a dim view of his fellow-supervisors.

It might appear that the boss who got along well with his own subordinates would also cooperate well with supervisors of equal rank. But it sometimes develops that a particular supervisor has a natural penchant for developing a group of subordinates who are fanatically loyal to him, yet who cooperate poorly with the employees of other departments. The foreman of such a tight-knit group usually encourages this insularity and clannishness and may set the example by cooperating poorly with other foremen. Most foremen like most of their fellow-foremen and are determined to get along with the remainder of the supervisory force.

8. *Are you satisfied with the rapidity with which you have been promoted?*

This is not a trick question, but it is one that cannot be satisfactorily answered without thought. In exceptional instances a supervisor may have been so fortunate as to have been shoved ahead rapidly, and in this case a flatly affirmative reply would be in order.

In most cases, however, promotion to worthwhile supervisory jobs comes rather slowly, and this is perhaps a good thing. It takes time to learn how to supervise people and the process cannot be much hurried. Whenever this has been attempted the results have not been satisfactory. *Apparently there is no adequate substitute for experience — years of it.*

Most supervisors would like to see promotions come oftener, yet unless others are being advanced over their heads they do not feel too strongly about the matter. They believe that if they do a good job they will not be overlooked when a better job is open, and in the meantime running their departments is sufficiently interesting and demanding work.

Thus, it may be said of the supervisor who is wholly satisfied with his rate of advancement, and of the one who is thoroughly dissatisfied with the frequency of promotions, that each may need to give a bit more thought to this matter of getting ahead.

9. *Do you know when and how to delegate authority to others?*

In a minor supervisory job the boss may get by for years without finding it necessary to trust others with authority. But unless he eventually learns to delegate authority, including when and how much, he definitely limits his own chances of advancement. Once executive rank

Therefore, if the supervisor gives all of his fellow-bosses blanket high praise he probably is not being altogether sincere.

11 Points for Checking Your Supervisory Qualities

is reached this matter of delegation must be studied carefully in order to ascertain the load any assistant may safely be expected to carry.

Delegation should be practiced as early as possible if for no other reason than that management often hesitates to promote a supervisor who has failed to develop a good second man. *The only way to properly teach an assistant how to run a department is to delegate to him sufficient authority to run it, whenever this is possible.*

Since the supervisor can delegate authority to an assistant, but must continue to be responsible for any errors this man may make, it calls for a certain steadfastness in the make-up of the boss before he can trust not only a subordinate with authority, but also his own judgment to select men who may be entrusted safely with authority.

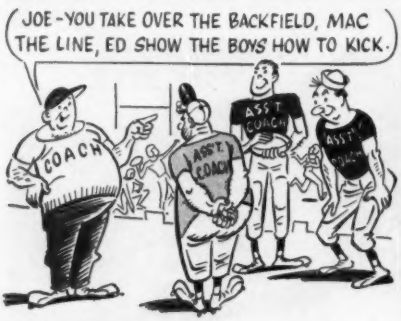
10. Are you a good teacher?

In every industrial organization we find one or more executives or supervisors who have acquired enviable reputations as developers of men. Throughout the plant, service in such a department is considered as something special in the experience record of any employee, and these people are always in demand in other departments and are potential supervisors.

The head of such a department is unusually proficient as a teacher. Any knowledge or skill he has acquired over a period of years he can readily impart to others and in such a manner that the teaching job does not have to be repeated. And he takes genuine pleasure in doing this.

Such a supervisor or executive has given thought to the proper sequence of operations in the teaching process, and it will be found that he has the following criteria in mind when he evaluates the job he is doing in imparting information to a subordinate:

(a) He ascertains the limits of the learner's previous knowledge of the subject, and thus bases his instruction on something the employee



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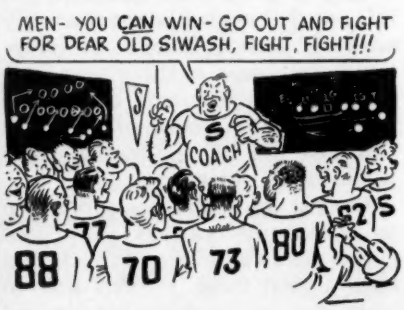

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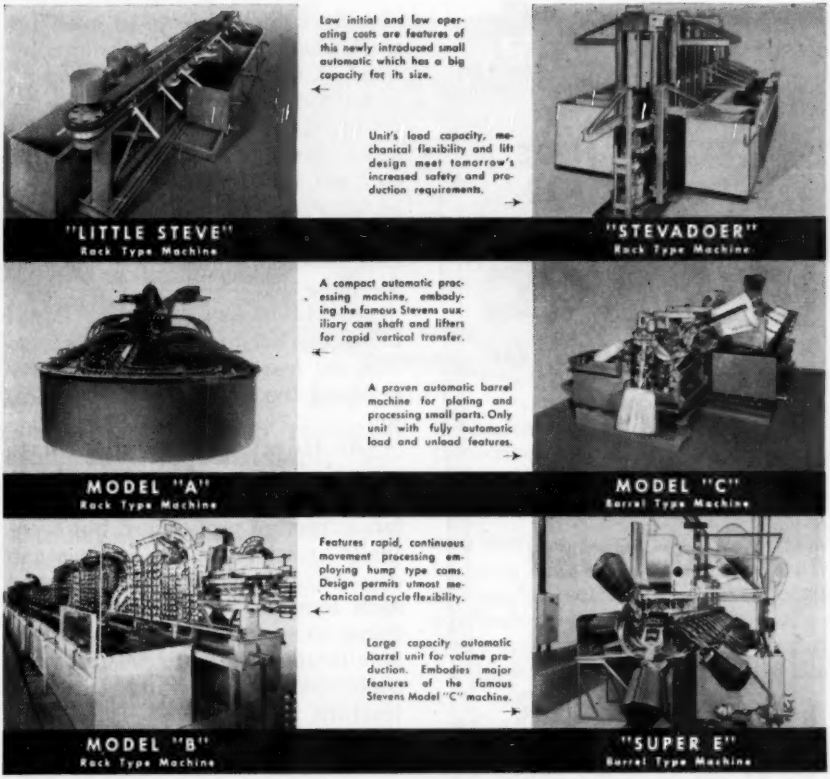
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already knows. Failure to take this preliminary precaution accounts for most of the serious breakdowns in industrial teaching.

(b) He puts over his new ideas in an instructional order, according to a scale of difficulty based on experience, rather than in a production sequence in which the most difficult lessons might well come at the outset.

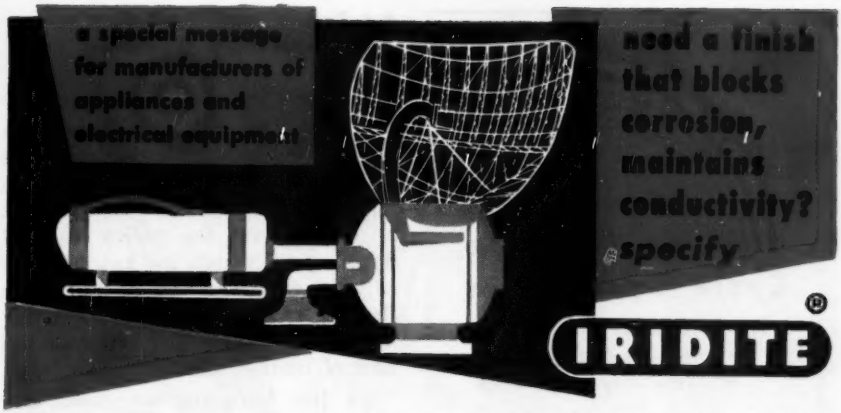
(c) He breaks up the material to be taught into small lessons, so that the learner has little difficulty grasping the new ideas in each lesson.

(d) He gives the subordinate plenty of time and opportunity to try out the new ideas in practice before expecting proficiency, but eventually insists that the learner can demonstrate that he has mastered each lesson. He does all of these things so smoothly that the subordinate is unaware that his superior is consciously employing the best teaching technique.

(e) Above all, the unusual developer of men has succeeded in mentally putting himself in the place of the learner, and thus can properly plan lessons and make allowance for the difficulties facing the employee who must grasp these new ideas. Such a teacher is a valuable man in any organization.

11. Can you defend a policy laid down by management even when you have not been informed of the reason for this ruling?

Any group of experienced executives rates loyalty as one of the essential eight among the qualities of leadership. *Loyalty in the case of the supervisor is a measure of the*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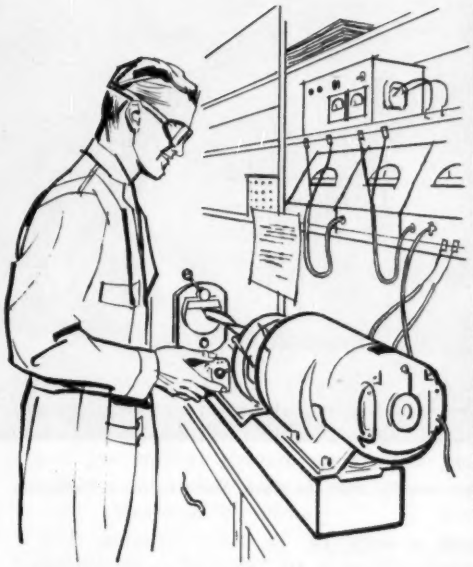
11 Points for Checking Your Supervisory Qualities

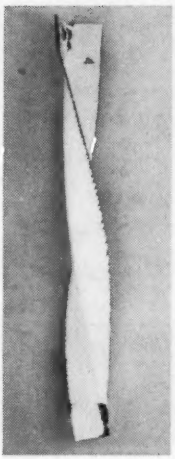
confidence he has in his management. If he feels their decisions are uniformly fair, in terms of the welfare of employees and stockholders, he will defend the policy so laid down even though he has no idea why it was formulated and even though, on its face, it appears to differ sharply from earlier action on the part of management.

In the foregoing we have discussed briefly eleven major divisions of supervisory responsibility. These are, (1) ability to plan work, (2) attitude toward subordinates, (3) ability to command respect, (4) ability to motivate others, (5) effective control of group, (6) voluntary assumption of responsibility, (7) cooperation, (8) personal ambition, (9) delegation of authority, (10) developing subordinates and (11) loyalty.

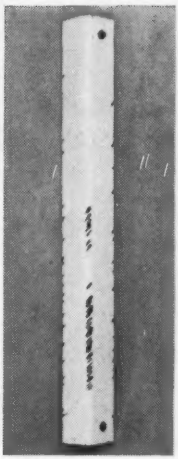
Supervision is a difficult and exacting art, and it is well to bear in mind that perfection in human relationships is something unknown. Thus, if the supervisor were to score himself in each of the phases of supervision listed above, certainly there would be no perfect scores. Averaging just above 70 in these 11 factors might appear to be a mediocre showing. Actually, this would not be a bad score. The supervisor who can conscientiously give himself an average of 70 on these 11 factors probably is a very good boss.

—Reproduced by permission of "Modern Machine Shop," a Gardner publication.





Enameling iron, with 1 coat of porcelain enamel over Parker Pre-Namel 410, was twisted 255° before enamel fractured.



Enameling iron, with conventional 2-coat system of porcelain enamel, fractured badly when twisted only 70°. (Twisted less than its elastic limit, metal returned to its original shape).

NEWS OF A REVOLUTION

that's about to happen!

Porcelain enameling on steel has always been a preferred finish. However, its use has been limited by cost and by difficulties in the processing.

Now, a big change is about to take place. It is coming about through a cooperative effort that we feel should be acknowledged.

First, Parker Rust Proof Company's research discovered and developed a surface treatment for steel which permits the application of the porcelain enamel finish coat directly to ferrous metals, reduces cost, improves quality and eliminates many production difficulties in porcelain enameling. For production evaluation, Frigidaire Division of General Motors and Pemco Corporation entered the effort with pilot runs and production tests.

The new treatment, making use of Parker Pre-Namel 410, has been shown to simplify porcelain enameling, achieve high quality uniform results, reduce use of frit, produce a more durable finish. Savings of from 1 to 3 cents per square foot of enameling surface are indicated.

We gratefully acknowledge the help we've had from Frigidaire and Pemco. Here is another instance of companies in diverse lines cooperating in a development program today which should benefit hundreds of manufacturers and millions of their customers in the future.

**Bonderite, Bonderlube, Parco, Parco Lubrite, Parker Pre-Namel—Reg. U.S. Pat. Off.*

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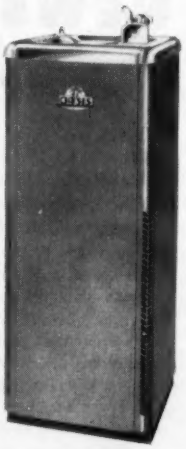
Finishing Facilities

Fig. 1 — Completely air conditioned plant recently built by Ebco Manufacturing Company.

By GERARD H. POLL, JR.

EBCO Manufacturing Company, founded in 1909, is a pioneer in the manufacture of "Oasis" electric drinking fountains, electric dehumidifiers, and refrigerated beverage dispensers. Newest product of the company is a hot and cold drink dispenser, which serves hot water from one spigot, for making coffee or soup from concentrates, and cold drinking water from the other spigot. The company hails this development as the answer to the "coffee break" in industry, since it is convenient for the employee, and means less time away from the job for getting refreshments.



Primary Ebco product: water coolers

The single story building (Fig. 1) houses 240,000 square feet of office and manufacturing space. A windowless building, no outside lighting is used with the exception of that streaming through the floor-to-ceiling windows in the beautiful visitors' reception room. Two reasons for this sort of construction are cited by Ebco engineers: the loss of heated and cooled air is reduced by not having windows, and the problem of uneven lighting, glares and shadows that accompanies outside lighting is abolished. Glareproof, shadow free lights are installed throughout, using 440 volt power. The factory has a uniform 55 foot-candles of illumination, produced by 1900 fluorescent lighting fixtures. The whole

in an Air Conditioned Plant

Some of the latest trends in the design of a manufacturing plant can be seen at the new plant of the Ebco Manufacturing Company of Columbus, Ohio, manufacturer of water coolers, beverage dispensers, and dehumidifiers. Wise planning is evident from two standpoints: efficiency of process and manufacturing facilities as well as materials handling; and in the construction of pleasant working areas—clean, well lighted, completely air conditioned.

manufacturing space has an open, airy appearance, with more than adequate space for each operation. Ten-foot-wide aisles allow ample room for motor-driven materials handling trucks to move about.

Materials Handling

The general plan of materials handling is calculated to give the fastest possible movement of materials with the least difficulty. Movement of raw materials and finished products is in a horseshoe shaped path. Fabricating and finishing operations are carried out generally in the center of the horseshoe and are connected by conveyors to the main materials flowpath. Raw materials and finished products move around the perimeter of the building, the finished products moving out of the plant on the same end of the building that the raw materials enter. Steel, for instance, is unloaded from motor cars by an overhead crane conveyor. It arrives in bundles of

Fig. 2 — Brass castings being buffed with sewed buffs and tripoli buffing compound, prior to chromium plating. Exhaust unit in the background removes dust and returns filtered air to the room. Notice the excellent illumination throughout entire plant area.

Fig. 3 — Plated parts being removed from chromium plating solution. Chromium is plated directly on brass. Current controls may be seen in the background. Plating racks are designed to prevent burning on edges of the parts. Fume scrubber helps to conserve air.

from 5 to 10 tons, in sheet form. These bundles are taken to the steel storage area, from whence they move to shearing operations as they are needed, and then to the necessary forming and finishing processes—all by overhead conveyor. The main transport conveyor running through this plant is a Tipp overhead cable conveyor.

Each department in the plant handles its own inventory. There is no central stockroom, except for small parts. Materials in storage are kept in neat stacks in open storage areas. This practice allows close control of raw materials by the department using them, and quick, convenient access to raw materials.

Finishing Processes

A wide range of finishing procedures is carried out in this plant, including chromium plating, spray painting, dip painting, silk screen printing, immersion tin plating, and hot dip tinning.

Fig. 4—Tank used in water cooler being removed from a bath of molten tin in hot dip tinning operation. Plastic exhaust duct for removing fumes can be seen at left center.

All of these processes are used in finishing various components of the company's water coolers and dehumidifiers. Chromium plating, for instance, is used for finishing the hardware on drinking fountains.

Bright chromium is plated directly on brass to a thickness of 0.00003 inch. Steps in the process are as follows: 1) The rough brass casting is ground on an abrasive belt machine; 2) buffing with sewed buffs, using tripoli buffing compound follows (Fig. 2); 3) parts are cleaned, racked and rinsed in hot water; 4) parts are chromium plated (Fig. 3); 5) residual plating solution is rinsed from the part in a water rinse; 6) a coloring operation (chrome rouge on loose buffs) gives the plated part a mirror bright finish. A Heil fume scrubber removes plating fumes from exhaust air. Small plastic floats are also used in the plating tank to reduce spray. Plating racks are made in the plant, and an air dry coating is used as the rack coating material.

Very little control is necessary to maintain the chromium plating bath used. Periodic analysis of the bath is made to make sure each component of the bath is up to strength and additions are made accordingly.

Analysis of the bath is as follows:

Chromic acid	47.7 oz./gal.
Hydrofluosilicic acid (30%)	53 cc./gal.

A Powers temperature regulator is used to maintain the temperature of the chromium plating solution at 155 deg. F. A General Electric rectifier is used to supply current for the plating operation.

Coils used in the manufacture of the pre-cooler are protected by application of a Battelle cold tin plating process. The tanks containing solutions used in this process are 2 feet square by 22 feet deep. Straight lengths of the tubing are immersed in this series of tanks, and thereby receive a protective coating on the inside of the tubing as well as on the outer surface. Stages in the process include cleaning, rinsing, immersion in sodium cyanide based tin solutions, a hot water rinse, and air drying. The process takes 1½ to 2 hours. Other copper coils receive a black finish on the exterior surface only.

Another tinning process is used in finishing the copper and brass tanks used to contain water during refrigeration in the Ebco water coolers. The tank and cooling coil are protected with hot dipped tin. Tanks are prepared for this process by immersion in an acid flux. They are then dipped in pure molten tin at 500 deg. F. (Fig. 4) and cooled immediately thereafter by immersion in water. The can is handled throughout these operations with a motor operated overhead hoist.

The top surface on some models of the water coolers is fabricated from stainless steel. This surface is given an attractive lustre by polishing with Speedie greaseless or satin finish buffing compound.

An American air filter dust collector is used to carry dust away from this phase of the finishing operations, removing dust from the exhaust before it is returned to the factory area.

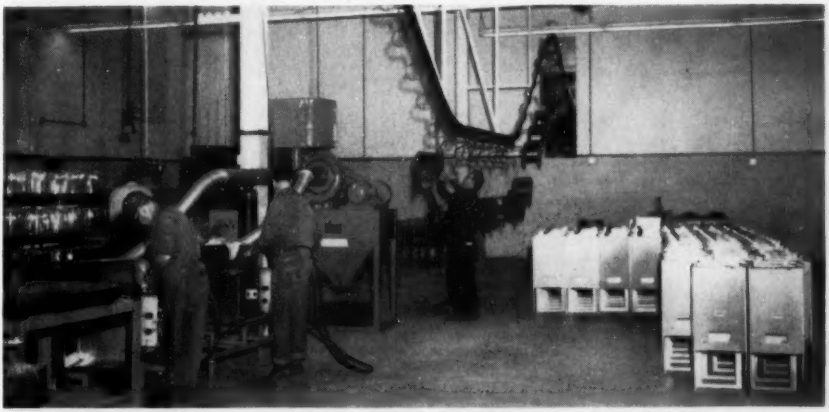


Fig. 5—Cabinets in the foreground are being metal finished with abrasive disc sanders prior to being loaded on the conveyor which will take them to the paint department (background). Dust collector at the left removes dust, and then returns clean air to the plant, thus helping to lower the amount of make-up air needed. Note the lack of crowding.

Paint Finishing . . .

After forming and welding operations have been completed, the steel cabinets are metal finished with disc sanders (Fig. 5). A Rotoclone dust collector is used here to remove airborne dust, so that air can be returned to the plant.

The largest finishing operation in this plant is paint finishing of cabinets and accessory parts for the cooler. Facilities for dip painting, spraying, cleaning, and silk screen printing are installed in one large completely conveyorized room.

This room is completely air-conditioned—a most unusual thing for a paint shop. This air conditioning is accomplished by robbing surplus air from the rest of the factory and refiltering it as it is blown into the paint shop enclosure. Even with dry-off and baking ovens, temperatures are kept at near optimum levels for worker comfort, raising both quantity and quality of paint shop work.

A five-stage washer and phosphatizing machine is used to clean the metal and apply a corrosion resistant phosphate coating. The machine features a rotary-arm spraying mechanism. This device is designed like a wheel with spokes, each of which has a series of nozzles spraying the solution on the parts being processed. In operation, the spokes turn while they are spraying, thus spraying in many directions, so as to reach every section of the article being cleaned. The cleaning and

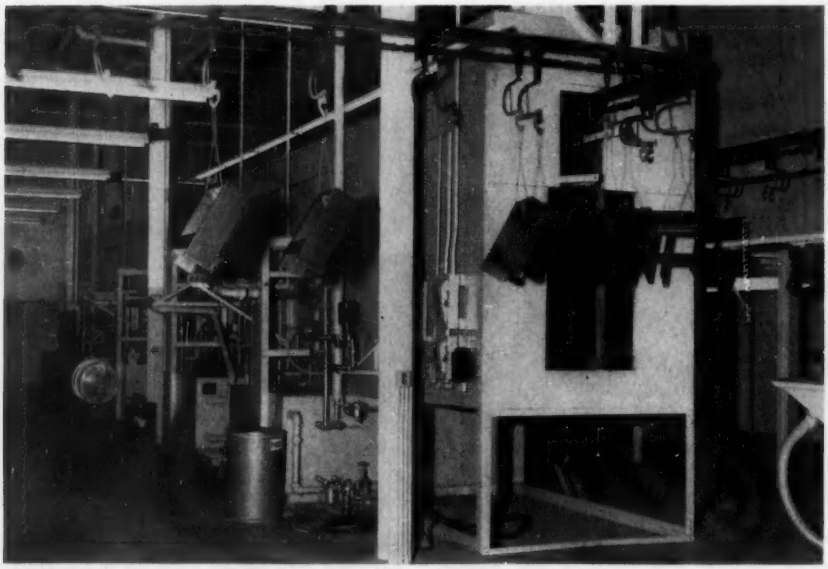


Fig. 6—Parts are shown entering the 5-stage rotary arm washing machine for cleaning and phosphatizing prior to the application of the paint. Washer is 66 feet long, 6 feet wide.

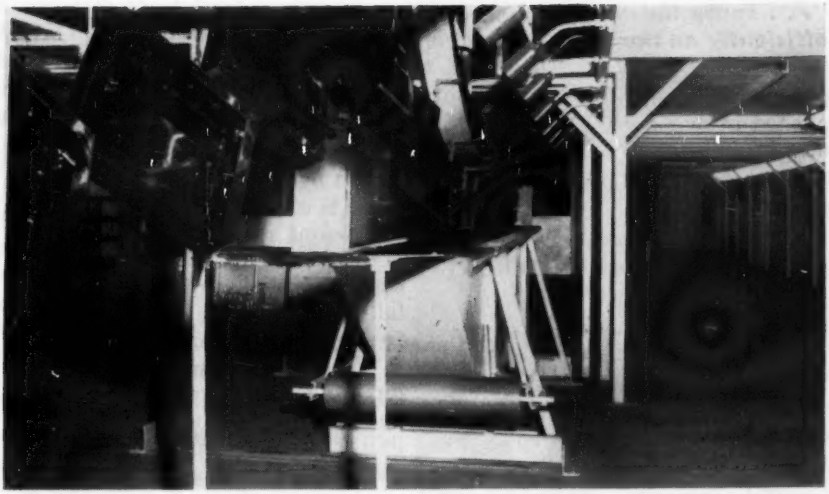


Fig. 7—Cabinet bases are carried by the conveyor through the paint dip tank. Dip tank can be moved to the left when not being used. It is mounted on rollers, moving on tracks.

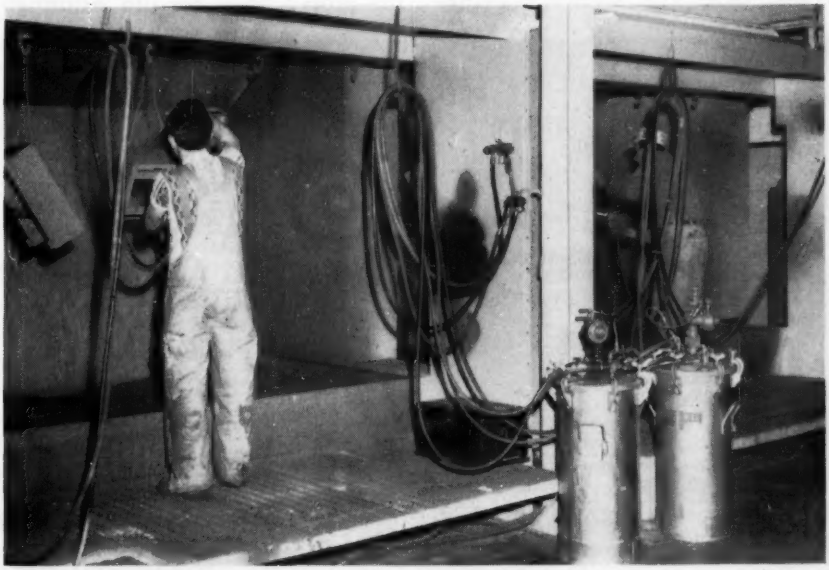


Fig. 8—A view of two of the four water wash spray booths used to apply the primer and finish coats. Pressure tanks supplying paint for the finish coat are in the foreground.

". . . spray finishing as well as dip finishing can be carried out efficiently on the same conveyor."

phosphatizing operation is accomplished in five steps, each 1½ minutes in duration:

1. Clean with Parco cleaner at 150 deg. F.
2. Hot water rinse.
3. Phosphatize with Bonderite 160 at 145 deg. F.
4. Cold water rinse.
5. Rinse with Parcolene solution.

The washer, 66 feet long and 6 feet wide, is constructed of mild steel, and has an opening 30 by 56 inches.

Following the cleaning and phosphatizing processes, the conveyor carries the cabinets through the dry-off oven, which is 38 feet long and 5 feet wide. This oven is normally gas fired, but can be converted to oil quickly. Temperature is automatically held at 300 deg. F. Time in the dry-off oven is 5 minutes. Conveyor speed is such that 15 minutes elapse for cooling prior to the application of the prime coat. A shield under the conveyor track prevents dirt from falling from conveyor heads on to freshly painted parts (Fig. 9).

A carefully planned conveyor, dip tank, and spray booth combination provides the necessary flexibility to allow spray finishing as well as dip finishing to be carried out efficiently on the same conveyor. As can be seen in Fig. 7, the conveyor is built so as to lower the objects at the proper point for dip painting.

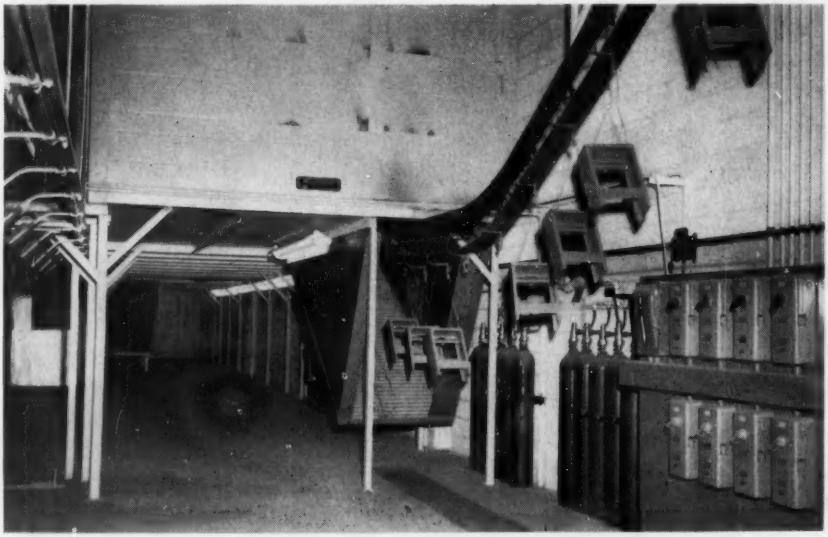


Fig. 9—Painted cabinet parts shown entering the baking oven. Oven is mounted above the floor level, in order to conserve floor space and keep heat at the ceiling level.

Mounted on two tracks, the dip tank can be rolled out of the path of the conveyor, thus allowing articles that are entering the department for spray finishing to pass the tank without being dipped. The tank is movable by hand, and thus can be removed from the conveyor path at any time in a matter of seconds. A battery of automatically actuated carbon dioxide nozzles are installed on each side of the dip tank for emergency fire protection. A black baking Japan is used in dip painting the condensers, cooling fins, beverage dispenser frames, and water cooler bases. The normal cycle includes dipping, 30 minutes air dry, and a 30 minute bake at 300 to 325 deg. F.

Cabinets are spray painted with a number of attractive finishes, including metallic, brown wrinkle and hammer finishes. Four DeVilbiss water wash spray booths are used in prime coating and paint finishing the cabinets. In the first two booths, a flash primer is applied, 7 to 10 minutes are allowed for flash off, and the parts enter the second pair of spray booths, where the finish coat is applied (Fig. 8). DeVilbiss spray guns and pressure tanks are used. Paint mixing and storage departments are located in separate rooms adjacent to the finishing department, directly in back of the finish coat spray booths. Primer is supplied under pressure from the paint mixing room directly to the spray guns, using a Graco pump to circulate the material through a piping system.

After a flash off time of 10 to 15 minutes, the cabinets enter the baking oven (Fig. 9), where they are baked at 300 to 325 deg. F. for 30 minutes. Paints used in this plant are

Fig. 10—Hot 'N Cold drink dispenser, newest product of Ebco Manufacturing Company.

Fig. 11 — Operating instructions being silk screen printed on a drink dispenser cabinet.

". . . provision for expansion even beyond the existing building has been made."

formulated so that the baking time and temperature can remain the same regardless of the type of finish being applied. The baking oven is engineered for gas or oil, normally using gas. The conveyor makes a triple pass through the oven (travels the length of the oven 3 times) so as to allow proper baking time in a minimum of space. The oven is 59 feet long and 13 feet wide. The opening for the conveyor and articles being processed to enter the oven is 7¾ feet wide. Fiberglas insulation is used in the walls of the baking oven to conserve heat and prevent heating of the room itself.

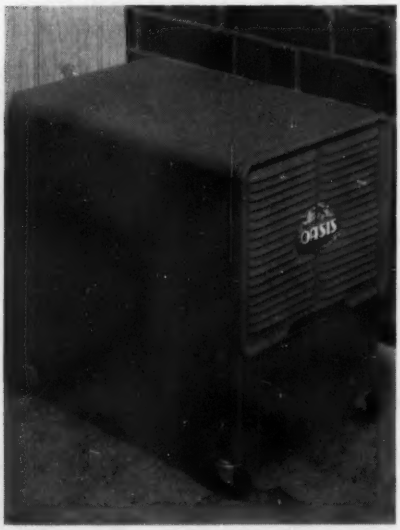


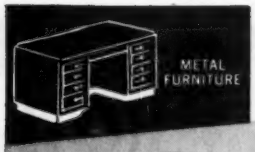
Fig. 12—Oasis Air Dryer, used for dehumidifying, is also produced in this modern plant. (Figs. 2, 10 and 12 courtesy Ebco Manufacturing Co., Columbus, Ohio. Other photos used in this article by PRODUCTS FINISHING.)

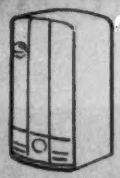
The paint department also includes silk screen equipment for applying directions and decorations over the baked enamel finish of drink dispenser cabinet tops (Fig. 10).

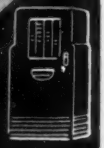
A control laboratory set up within the plant makes the necessary checks to ensure maintenance of the high standards set up for Ebco products. Control checks on finishes are made on random test panels daily, and include tests for gloss (a Gardness Glossmeter is used), impact, conical mandrel test, and chromium plate thickness (the plate is dissolved and thickness is then checked by weight loss).

The equipment for air conditioning and heating this huge building is located in six penthouses on the roof of the building. The amount of makeup air is manually controlled from a centrally located panel.

The progressive spirit of enterprise that helped to make the dream of Ebco officials come true has not been allowed to die with the building's completion. Engineers and officials of the plant, who worked long and hard to build their ideal of a plant have not retired on their laurels. Concrete evidence of this fact can be seen by the fact that further expansion room has been provided generously in existing facilities, and deliberate provision for expansion even beyond the existing building has been made. One complete wall of the building has been constructed so that it may be moved when additional space is required.







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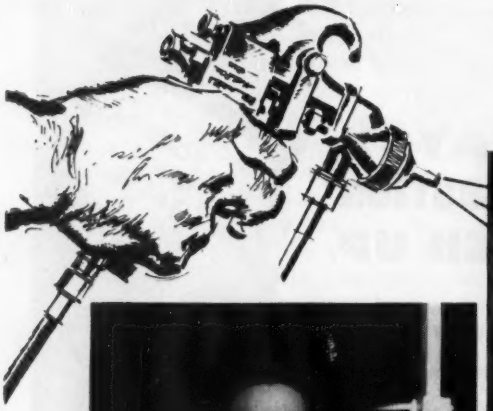

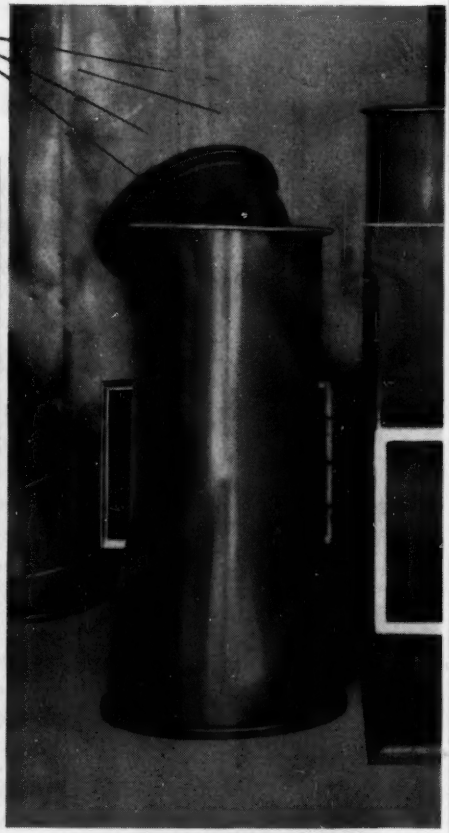

Ductwork finished with Unichrome Plastisol Coatings. Photo courtesy Kaybar, Incorporated, Hazel Park, Mich.

Freezer baskets being finished with Unichrome Plastisol. Photo courtesy Peerless Wire Goods, Lafayette, Indiana.

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- **Tough, thick, rubber-like corrosion resistant coatings open new opportunities for better metal protection at lower cost . . .**

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Editorial Review of the 42nd A. E. S. Convention

By EZRA A. BLOUNT
Editor

A NEAR-RECORD REGISTRATION of over 1550 indicates that the 42nd Annual A. E. S. Convention, held in Cleveland, June 20 to 23, was a most successful affair.

The 4th Industrial Finishing Exposition, held at the same time, attracted over 6,000 visitors. The Exposition was made up of 145 bright and beautiful exhibits, designed to dramatize the importance of attractive and durable surface finishes in product manufacture and sales.

Great emphasis was placed on new finishing methods and mechanical or automatic finishing equipment. Those who visited the Finishing Show certainly received a liberal education in the many products, processes, machines and equipment available to the finisher.

Other organizations in the Finishing Industry usually hold meetings during an A.E.S. Convention. The Metal Finishing Suppliers' Association held its annual business meeting, attended by 160 suppliers, and elected officers. The new officers of the organization are: Herman J. Struckhoff, Lasalco, Inc., president; Joseph J. Duffy, Jr., Pennsylvania Salt Mfg. Co., 1st vice president; Dr. M. M. Beckwith, Harshaw Chemical Co., 2nd vice president; E. W. Couch, Lea Mfg. Co., 3rd vice president; T. A. Trumbour, Finishing Publications, Inc., treasurer; A. P. Munning, Munning and Munning, Inc., secretary; Manson Glover, Glover Coating Corp., past president.

Trustees (in addition to the officers) elected are: John A. Bauer,

Fig. 1—At the opening business session of the A.E.S. Convention, Manson Glover presented the keynote address on the subject, "The Role of the Metal Finishing Suppliers' Association in the A.E.S." Shown on the platform with Mr. Glover are, left to right, E. L. Combs, Convention general chairman (partly hidden by the rostrum), Dr. Ralph A. Schaefer, Clyde Kelly, Dr. Samuel Heiman, Francis T. Eddy, Dr. George P. Swift.

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*Can be arranged for any height from tote pan to 55-gal. drum.

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The organization of job platers, the National Association of Metal Finishers, formed by the recent merger of NAMF and NFMF, elected officers and held several meetings to formulate a policy for the group. The new officers of the NAMF are: John Palik, Jr., president; Lawrence J. Hay, 1st vice president; Paul E. Miller, 2nd vice president; Frank Kaiser, secretary-treasurer; and Sal Novelli, asst. secretary-treasurer.

A combined meeting of Branch Librarians and instructors of electroplating courses was held. Clyde Kelly, A.E.S. president-elect, presided. Dr. Samuel Heiman, A.E.S. 1st vice-president-elect, spoke at the meeting, both in his capacity as a plating class instructor and also as the editor of the A.E.S. Branch Officers' Manual. Ezra A. Blount, editor of PRODUCTS FINISHING, summarized his paper, "Methods of Conducting Classes for Electroplaters," presented at the Convention.

Representatives of the A.E.S. Editorial Board, and many of the Branch Librarians discussed problems in connection with speakers, conduct of Branch meetings, and securing papers for publication.

The Educational Program for the Convention included more papers on a wider range of subjects than were presented at any previous convention. Some of them will be reviewed briefly here.

"Plating of Beryllium Copper," by S. J. Morana, Beryllium Corp., Reading, Pennsylvania.

Beryllium-copper alloys are finding increased use in a wide variety of products by reason of their good mechanical and physical properties. Consumption is now at the rate of 60,000 pounds per month, and this figure is expected to increase.

Fig. 2—The A.E.S. was represented by Dr. Ralph A. Schaefer, president, and P. P. Kovatis, executive secretary, at the annual meeting of Metal Finishing Suppliers' Association, Inc.

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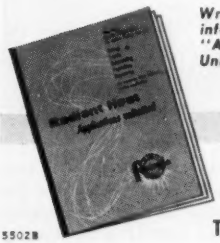

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1. Silver plate for improved electrical contact and other electrical properties.
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3. Hard chromium plating of Be-Cu plastic molding dies for corrosion resistance.
4. Gold or rhodium plate as a decorative finish.
5. Tin or nickel and/or chromium for improved appearance.

In addition to regular cleaning and degreasing procedures, Be-Cu alloy products must be processed through a special pickling cycle:

1. Pickle in 20 to 30 per cent hot sulfuric acid.
2. Pickle in 30 per cent cold nitric acid.
3. Rinse in cold water.
4. Neutralize in trisodium phosphate.
5. Rinse in hot water.

The author discussed processing cycles for producing the various finishes in some detail, including facilities and equipment for continuous plating of coils of strip stock.

"The Anodic Etch in Preparation for Plating," by V. L. McEnally and Fred G. Brune, Chrysler Jet Engine Plant, Detroit, Mich.

Good adhesion of nickel plate to low carbon steel was secured by making the steel the anode in a saturated solution of epsom salts in 25 to 26 per cent (by volume) sulfuric

Fig. 3—At the Branch Librarians' luncheon, instructors and former instructors of electroplating classes discussed methods of presenting courses in plating and problems connected with plating classes. At the meeting conducted by Clyde Kelly, were representatives of the A.E.S. Executive Board and Editorial Board, who discussed mutual problems.

"BUCKY" thanks YOU!

Just a word of appreciation for the interest shown by the many who visited our booth at the Cleveland Industrial Finishing Exposition.

It was a pleasure to meet old friends and make new friends . . . And we are grateful for the favorable words spoken in behalf of Buckingham Products and Service.

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acid. The authors found substantial savings in equipment cost and operating cost by using this pre-plating etch rather than the anodic etch in 55 deg. Be' sulfuric acid.

Steps in the process are:

1. Alkaline, high pressure spray wash.
2. Anodic electroclean at 75 a.s.f.
3. Warm water rinse.
4. Cold water rinse.
5. Muriatic acid dip, 10 per cent by volume.
6. Cold water rinse.
7. Anodic etch, epsom salt-sulfuric acid at 50 a.s.f.
8. Cold water rinse.
9. Nickel plate.

In addition to its usefulness as an anodic etch prior to plating nickel direct on low carbon steel, the process can be used as a pre-plate treatment for plating over nickel plate.

"Practical Methods for Treatment of Metal Finishing Wastes," by J. C. Hesler, Industrial Filter & Pump Mfg. Co., Chicago, Ill.

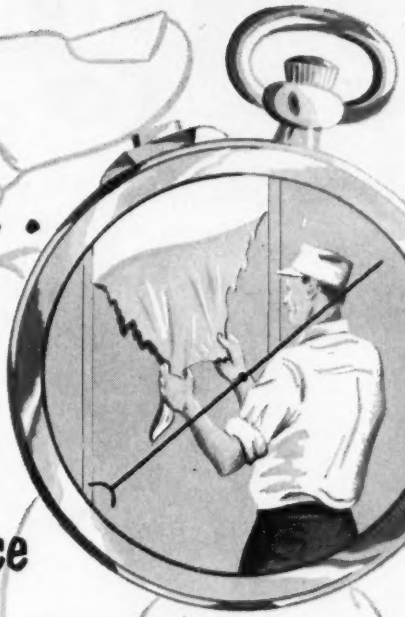
Every finishing plant should take steps to reduce or eliminate contaminated waste, and/or segregate the waste that must be treated into separate systems; one for concentrated solutions, and one for dilute solutions. Several sources of waste were mentioned.

Alkaline wastes can be used in the alkaline chlorination of cyanides, and in the precipitation of metals from waste water.

Ion exchange systems can be used to recover chromium from chromi-

to page 74 →

Fig. 4—A subject of specific interest to job platers as well as other platers was presented by Arthur G. Pierdon at one of the educational sessions. Mr. Pierdon spoke on "Job Plating Shop Costs and Their Relation to Pricing." (PRODUCTS FINISHING Staff Photos)



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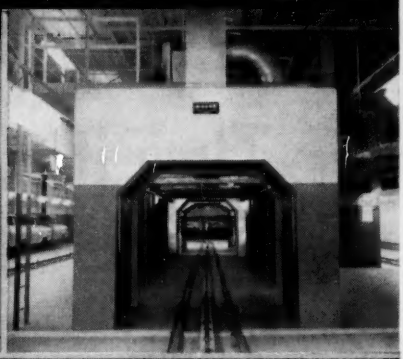

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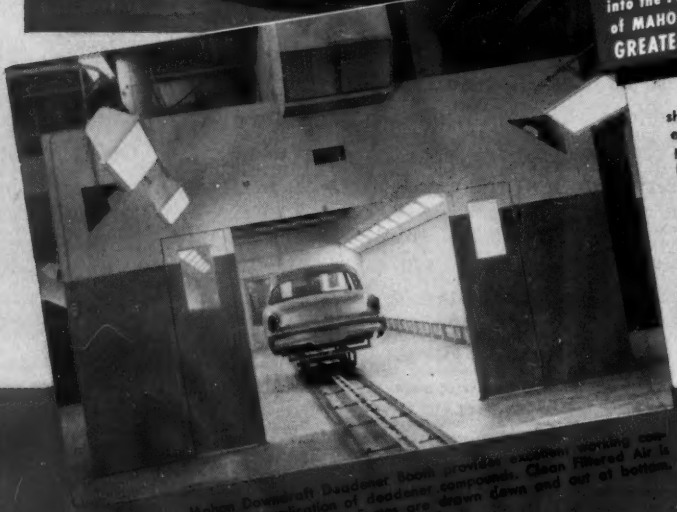

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Illustrations on these pages show some of the major units of equipment that make up a Complete Mahon Automobile Body Finishing System. At top above, you see typical Mahon Dry-Off and Finish Baking Ovens. Immediately above is a general view of the Finishing System which has a single production line with a total conveyor length of four thousand five hundred feet. Note Air Supply arrangement which provides an overall pressurized finishing area.

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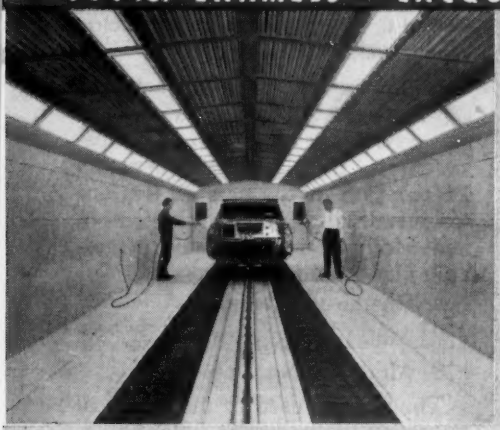

Mahon Dry-Sump, Downdraft Hydro-Filter Spray Booth with Remote Sludge Tank and Automatic Sludge Unloader.

Interior of Mahon Pressurized Tack-Off Enclosure at entrance end of a Finish Coat Hydro-Filter Spray Booth.

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The answer to that question is very simple. In the first place, they want Mahon *KNOW-HOW* In the second place, they want their entire finishing system planned, coordinated, engineered and installed by one responsible organization. In other words, they want one responsibility for final results—which are the quality and the cost of the finish on a product. Many things enter into these two end result items . . . most important are the operating efficiency and the operating cost of the finishing equipment. Most manufacturers have found that this is where the true worth of Mahon equipment shows up . . . it isn't built to a price, it is built to do a job. If you have a finishing problem, or are considering new finishing equipment, you, like thousands of other manufacturers, will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified to do the all-important planning and engineering of equipment—which is the key to fine finishes at minimum cost. You will find also, that Mahon equipment is built better for more economical operation over a longer period of time—a factor to be weighed carefully when comparing initial cost figures. Mahon will do your complete job on one contract . . . undivided responsibility for the entire system insures proper coordination and safeguards you against complications which can upset your production schedules. See Mahon's Insert in Sweet's Plant Engineering File, or write for Catalog A-655.

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um hot rinse tanks, and conserve heat as well as water.

New cation exchange resins will remove iron, aluminum, copper, and other metals from chromium plating solutions containing up to 50 oz./gal. chromic acid. Resin life is about 300 actual contact hours. In the past it was necessary to dilute to 16 oz./gal., purify, and then concentrate by evaporation of water.

"Lead-Tin-Antimony Plating," by R. T. Putnam and E. J. Roser, Pratt and Whitney Aircraft Co., East Hartford, Connecticut.

An alloy containing 7 per cent antimony, 11 per cent tin, balance lead is plated on silver-lined aircraft engine bearings from a fluoborate bath. The solution and operating conditions are:

Lead fluoborate	100 gm./l.
Tin fluoborate	30 gm./l.
Antimony fluoborate	6 gm./l.
Peptone	15 gm./l.
Current density	0.28 amp./sq. in.

The solution, which contains some free acid, is filtered continuously through cotton filters and also circulated continuously. The alloy percentage is controlled by the current density. Lead-tin anodes are used, the antimony being added as antimony fluoborate.

Silver bearings are prepared for plating by alkali cleaning and scrubbing in water with pumice, using a hand brush.

The lead-tin-antimony alloy is stated to be more corrosion resistant and harder than a lead-indium alloy, but its load carrying characteristics are not as good as those of the lead-indium.

"Electroless Nickel Plating of Non-Conductors," by Philip Eisenberg and Harold C. Schneider, Sylvania Electric Products Co., Hicksville, N. Y.

In the manufacture of metal-to-ceramic seals, electroless nickel plate was used as the bonding medium between the metal and the ceramic. Preparation of the ceramic surface for metallizing was the chief problem. Methods used to form the metallic film included:

1. Chemical reduction.
2. Metal spray.
3. Metal evaporation.

The process used in the chemical reduction method is as follows:

1. Alkali clean.
2. Chemical etch of the ceramic surface with a hydrofluoric sulfuric acid mixture.
3. Seed the etched surface by means of solutions of nickel sulfate and sodium hypophosphite.

The surface may then be plated with electroless nickel using the Bureau of Standards solution and process. The solution and operating conditions are:

Nickel sulfate	30 gm./l.
Sodium acetate	10 gm./l.
Sodium hypophosphite	10 gm./l.
pH	4-6
Temperature	176 deg. F.

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"Some Aspects of Solution Level Control," by J. W. Holland, Loren Stevens, Nello Arterburn, Indianapolis Branch, A.E.S.

Pointing out that solution level control is a neglected plating variable, the authors discussed the following methods for keeping plating solutions at the desired level:

1. Manual control.
2. Gravity feed with an air lock.
3. Direct acting float valves.
4. Float switch and solenoid.
5. Induction relay.

"Recovery of Plating Wastes," by Dr. Louis Weisberg, Consultant, and E. J. Quinlan, Channel Master Corp., Ellenville, N. Y.

Emphasis on the handling of plating wastes should be on the recovery of valuable materials, not their destruction. Wastes should be segregated into three groups to help accomplish this goal.

1. Alkalies and acids, capable of self-neutralization, should be collected in the same system. Then they can be blended, neutralized, and allowed to settle. Sludge can be removed as needed. Two parallel tanks are suggested.

2. Zinc cyanide. Rinse water from a four-compartment counter-current rinse tank, used to rinse zinc plated parts, is evaporated to recover the cyanide. In the plant cited, 160 pounds cyanide are recovered daily.

3. Chromic acid from conversion coating solutions. Metals are removed from this waste in a cation exchanger. The unit is regenerated with sulfuric acid. The metal sulfate solution so produced is neutralized

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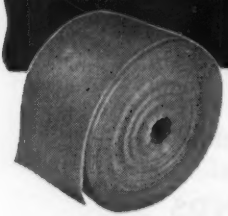

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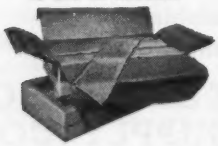

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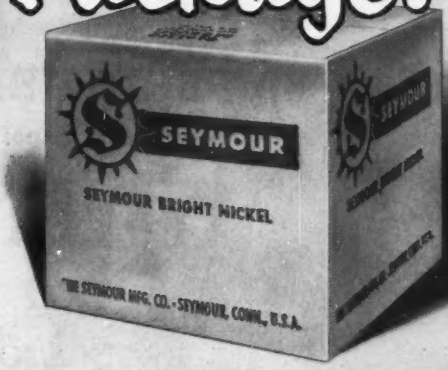

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and the metals precipitated from the solution with lime.

"Filtering Chrome Plating Solutions," by R. F. Ledford, Industrial Filter and Pump Mfg. Co., Chicago, Ill., and Lloyd Gilbert, Rock Island Arsenal.

A smoother, heavy chromium plate can be produced in a solution free from solids. It is preferable to plate smooth, rather than "overplate" and grind smooth. Cation exchangers and filters can be installed for continuous operation. Trivalent chromium is not picked up well by a cation exchanger, but it can be oxidized to hexavalent chromium with potassium permanganate.

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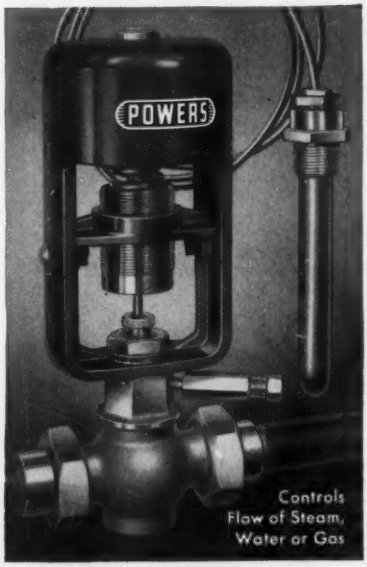

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"The Effect of Different Chromium Deposits on the Fatigue Strength of Hardened Steel," by J. E. Stareck, E. J. Seyb, A. C. Tulumello, United Chromium Corp., New York, N. Y.

Chromium plates produced in different plating solutions under different plating conditions exhibit different crack patterns. Physical tests of chromium plated steel showed that the fatigue limit increased with an increase in the number of cracks per inch in the chromium plate. It was noted that stress decreased as fatigue in-

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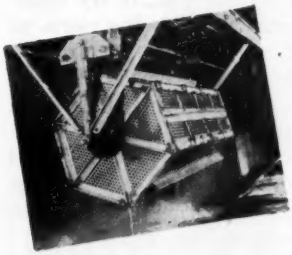

Small aluminum parts are Alodized in this power-driven squirrel cage tumbler.

Man kneeling at left is adjusting faucet of "Alodine" tank. All tanks hold 5,500 gallons. Note simplicity of operation.

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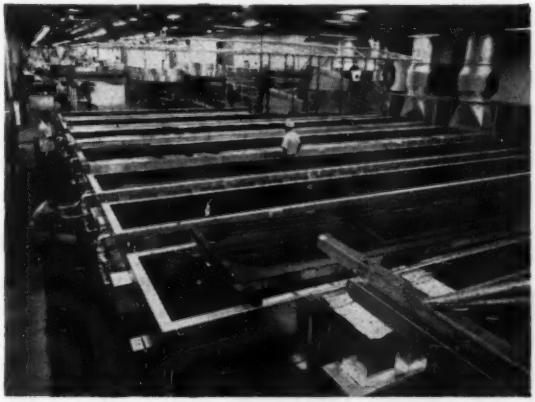

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creased. In an unplated steel, a change in the tensile strength of the steel is accompanied by a corresponding change in the fatigue limit. This relationship does not exist in a chromium plated steel; the chromium plate is the dominant influence.

"Electrophoretic Deposition of Metallic and Composite Coatings," by J. J. Shyne, H. N. Barr, W. D. Eletcher, and H. G. Scheible, Vitro Laboratories Div., Vitro Corp., West Orange, N. J.

The authors described a process of moving charged particles (325 to 600 mesh) through a liquid to an electrode by means of a d.c. potential. Manufacture of rubber gloves, deposition of alundum on vacuum tube heating elements, and deposition of metal oxides were cited as applications of the possible processes. After depositing a metal oxide, it may be bonded to the base by reduction with hydrogen, or by depositing a metal through the pores of the oxide.

Throwing power is stated to be excellent due to the insulating value of the coating, and uniform, even deposits were produced. Up to 1000 volts are employed at a current density of 0.05 to 0.3 a.s.f. About 10 gm./coulomb can be deposited.

Steps in coating formation can be grouped under three headings:

1. Prepare coating suspension. Grind in a ball mill in an organic medium to a fineness of 0.1 to 44 microns. The electric charge is acquired in this step.
2. Applying the coating. An oxide

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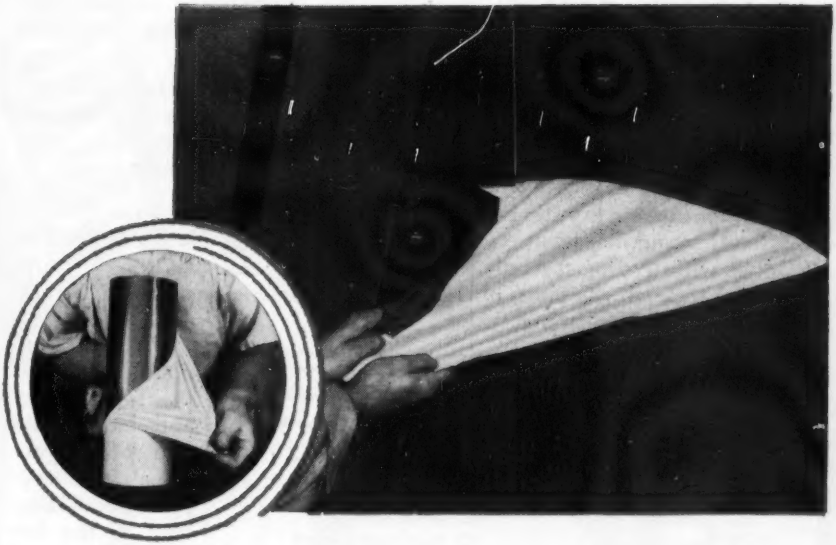

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such as nickel oxide may be applied in an anhydrous solvent, and a thickness of 4 to 5 mils secured in 20 to 40 seconds. This step is followed with an alcohol dip, air drying, baking.

3. Bonding and densification. Reduce with hydrogen or deposit metal through the pores of the oxide. Ball burnishing, pressing, or sintering are compacting and densifying techniques employed.

Many oxides, cermets, nickel and tungsten carbides have been deposited electrophoretically. Any resin may be similarly deposited.

"Copper Anode Corrosion in Cyanide and Acid Copper Plating Baths," by W. H. Safranek and Dr. C. L. Faust, Battelle Memorial Institute, Columbus, Ohio.

The authors point out that the low density and large grain size of conventional cast copper anodes may lead to the formation of anode sludge particles. Dense, high purity, oxygen-free cast copper anodes produced no nodules when corroded in sodium and potassium cyanide copper plating solutions. No polarization was noted up to 80 a.s.f. Slight sludge was produced — apparently from hard water used to make up the bath. At 15 a.s.f. there was roughness in the copper plate; at 75 a.s.f. a smooth

which of these FINISHING PROBLEMS are yours?

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- ☐ Decorative effects
- ☐ Paint adhesion
- ☐ Plating bond
- ☐ Anodized film adherance
- ☐ Satin finishes
- ☐ Instant wetability
- ☐ Welding bond
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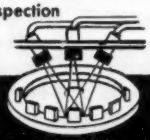
- ☐ Brazing bond
- ☐ Preparation for non-destructive testing
- ☐ Lubrication retention
- ☐ Surface activation
- ☐ Stress relief
- ☐ Vinyl coating bond
- ☐ Ceramic coating bond
- ☐ Smoother surfaces
- ☐ Etching
  - ☐ Plastic
  - ☐ Metal
  - ☐ Glass
- ☐ Elimination of galling
- ☐ Reduction of friction
- ☐ Visual inspection



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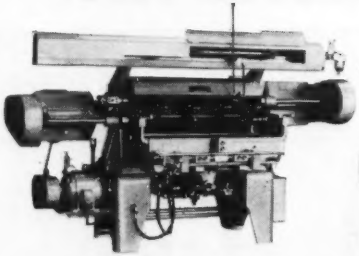
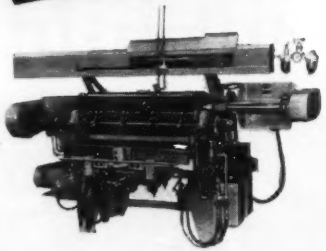
COMPLETE SURFACE FINISHING UNIT

for SPOONS and FORKS!

CLAIR

Work racks, spindles and most moving parts are interchangeable on all Clair machines. Numerous optional features, such as Auto-cycling, Automatic Compound Applicators etc.



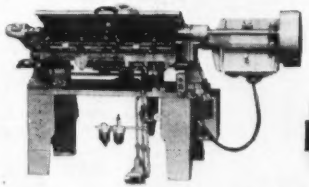


208 This "upside down" version of the staggered spindle assembly employed in the Model 204 serves as a companion machine capable of finishing Spoon and Fork handles and similarly curved items.

204 This Clair machine, like others illustrated, was custom made to fit a special need in the silverware industry for surface finishing Spoons and Forks. This machine uniquely allows simultaneous coverage of both inside and outside bowl surfaces, at any uniform predetermined buffing pressure.

ELECTRO-HYDRAULIC

All these machines have the "electro-hydraulic" feature for safe, economical operation. The patented quadrant mechanism is the unique principle that permits complete batch finishing of Spoon bowls and like objects. These three machines constitute a unit which permits complete surface finishing without "unloading" and "re-racking" normally encountered between operations.



205 To speed up the total operation this air-actuated Model was designed for supplemental coverage of deep bowl curvatures, both Spoon and Fork.

CLAIR
MANUFACTURING CO., INC.
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Write now for further information on any surface finishing problem that confronts you!

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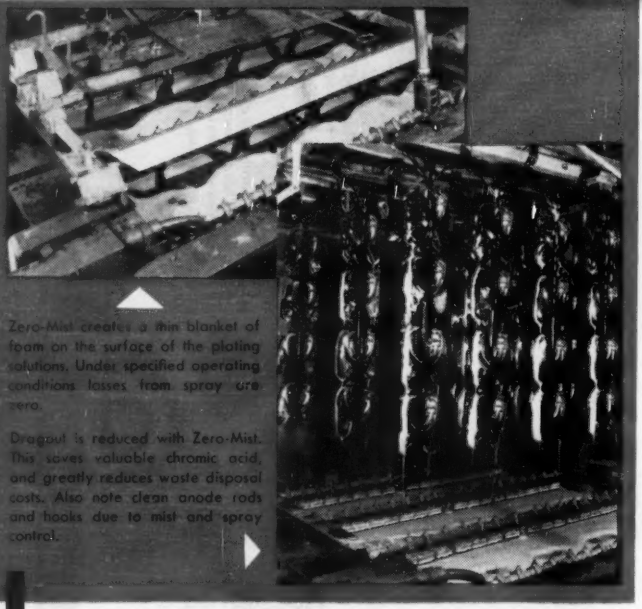

Zero-Mist creates a thin blanket of foam on the surface of the plating solutions. Under specified operating conditions losses from spray are zero.

Dragout is reduced with Zero-Mist. This saves valuable chromic acid, and greatly reduces waste disposal costs. Also note clean anode rods and hooks due to mist and spray control.

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***Get a free sample of* ZERO-MIST**

for an easy test in your own shop

Now you can make your own simple test of Zero-Mist—the magic new product which controls mist and spray in chrome plating baths. Udylite is making this offer to familiarize chrome platers with the many advantages of Zero-Mist.

Many chrome platers are now using Zero-Mist with amazing results. Here's what it will do for you: give absolute control of chromic acid mist and spray saving up to 30% of chromic acid loss through the ventilating ducts—reduce the workroom air pollution—cut dragout losses—lessen pollution of rinse water—save on maintenance of existing hoods, ducts and fans used in ventilating systems—cut your chromic acid losses from mist, spray and dragout up to 70%.

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plate was produced from oxygen-free anodes without using diaphragms.

Using oxygen-free copper anodes in the acid copper sulfate plating solutions, smooth plates in thick films were produced. In the acid copper solution, oxygen-free copper anodes dissolved more uniformly and produced less scrap than conventional cast copper anodes.

Educational Sessions were well attended, pointing out the society's role as an educational and technical organization, and giving evidence of the active interest of the members in technical developments.

At the final business session of the A.E.S., all officers were advanced, Clyde Kelly, American Plating Co., being elevated to the presidency. Herberth E. Head, Chrysler Corp., Detroit, was elected 3rd vice president. Sites for future A.E.S. Conventions are as follows: 1956—Washington, D. C.; 1957—Montreal, Canada; 1958 — Cincinnati, Ohio; 1959—Detroit, Michigan. (Next Industrial Fin-

Herberth E. Head

ishing Exposition will be held in 1959 at Detroit.) No site was chosen for the 1960 Convention.

★ ★ ★

1950-51 Bibliographic Survey of Corrosion. More than 4,400 abstracts and 4,000 authors are classified and indexed in the 1950-51 Bibliographic Survey of Corrosion, now available from the National Association of Corrosion Engineers, 1061 M & M Bldg., Houston 2, Texas. The book sells to members of the National Association of Corrosion Engineers for $10.00 and to non-members for $12.50. 430 pages.

This is the fourth of the series of bibliographies published by NACE. The others are 1948-49, 1946-47 and 1945. Each volume includes abstracts of corrosion literature published in the indicated years, classified according to the NACE's Abstract Filing System and including both alphabetical subject and author indices. The volumes contain 12,414 abstracts.

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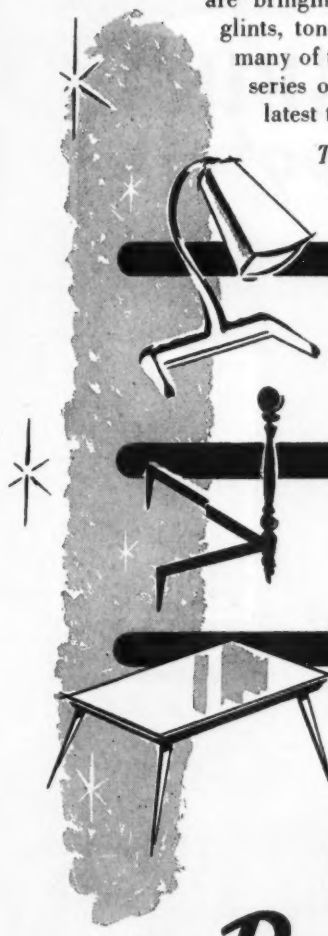

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Spotlighting FINISHING Progress

Unsolved Problems

TWO PAPERS presented at the Fourth International Conference on Electrodeposition and Metal Finishing were concerned with unsolved problems in metal finishing.

The two papers on unsolved problems were presented by a British and an American author. The problems discussed are, however, universal in scope, and of interest to electroplaters in all countries. They are not particularly new, but have been recognized as problems for many years. It is hoped that this discussion will lead to renewed interest in their solution, and to increase research.

W. L. Pinner, of the Houdaille-Hershey Corp., Detroit, discussed principally problems relating to the deposition of copper and nickel on steel. He pointed out the great advances of the past thirty years, including the development of high speed nickel plating and the control of lustre, hardness, and ductility. Cleaning procedures and control techniques, including solution analysis and deposit control, have made great progress.

Mr. Pinner philosophized on the fact that increased knowledge in this or any other field causes greater awareness of problems still

By Dr. C. Fred Gurnham, Head, Dept. of Chemical Engineering, Michigan State College

A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

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• *We will be pleased to receive blue prints or preferably finished and unfinished samples of the part you contemplate finishing together with detailed information on present finishing operation and production requirements. On receipt of samples and data we will offer recommendations and quotations.*

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present. The ultimate goal — production of the highest quality possible at the lowest manufacturing cost—will never be realized, but should be sought continuously.

Corrosion Resistance of Nickel Deposits

Mr. Pinner described briefly the exposure test program of Committee B-18 of the American Society for Testing Materials. Many sets of panels have been exposed to various atmospheres, to explore the corrosion resistance of various thicknesses and types of nickel and copper-nickel coatings on steel. The great effect of basis metal condition is unquestioned, but an adequate theoretical explanation of this effect and means for exploiting the effect more fully are still lacking.

Double platings of nickel in which the first deposit was buffed, or buffed and annealed before the second coating showed an unusual degree of corrosion resistance. A first hypothesis attributed this to closing of the pores by buffing; however, if this were true, there would be little need for the second electrodeposit. It seems more logical to assume that the buffing conditioned the surface in such a manner that the second coating was deposited in a relatively nonporous condition. Corresponding effects,

Whatever your D.C. requirement....

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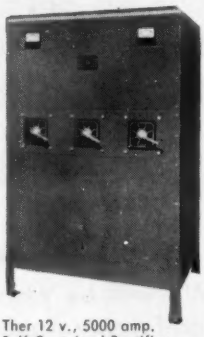
Best suited to your particular operation.



Ther 12 v., 5000 amp. Self-Contained Rectifier.

Feature by feature, Ther Plating Rectifiers are job-rated to give you the most in D.C. power for your operation.

Conservatively rated premium quality selenium stacks deliver D.C. at peak efficiency to cut production time to a minimum and save on power costs.

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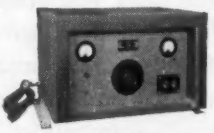
Copper conductors and bus bars are used throughout to provide maximum conductance and resistance to corrosion.

Fully enclosed ball-bearing fan motors are incorporated in all units.

Vacuum cooling, proven in practice as the most effective means of producing uniform air distribution.

Models are available as either 5% or 18% ripple depending on which is most suited to your operation.



Ther also manufactures Bench Model Rectifiers. All models are drip-proof in construction, convection cooled and complete with stepless variable voltage control. Sizes range from 25 to 250 amps. 6 v., 150 amps. unit shown.

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Magnus Aja-Lif Cleaning Machine for precleaning with any suitable Magnus Precleaning Material.

Stop wasting the cleaners you use to get a chemically clean surface for electroplating. Precleaning takes off most of the dirt to a physically clean surface, avoiding contamination in final alkaline or electro-cleaning operations.

Stop wasting manpower in hand cleaning operations on hard-to-remove buffing compounds, cutting oils and similar dirts.

Stop wasting effort in trying to remove solid dirt particles which do not come off wth vapor-degreasing methods.

Let Us Show You What Economical PRECLEANING is

There are a number of Magnus Cleaners ideally adapted to precleaning operations, each rendered more effective and economical when used in Magnus Agitating Cleaning Machines of suitable capacity and design to meet your production requirements. On the majority of precleaning operations, Magnus Precleaner (dip or spray), followed by a thorough water rinse, will give you parts ready for all finishing operations except electroplating . . . and in far better condition for final cleaning for plating.

ASK FOR A DEMONSTRATION
. . . in your plant or in the Magnus Pilot Plant Laboratory

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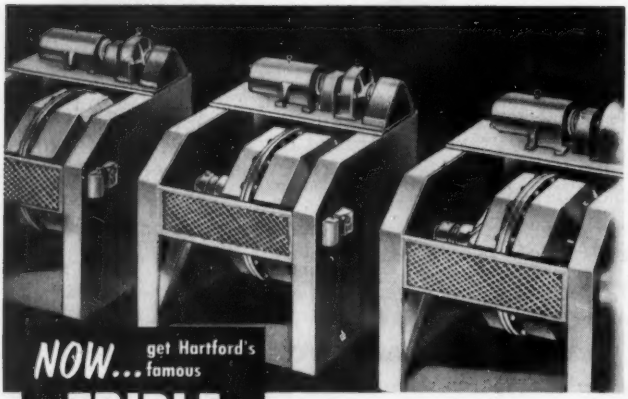
however, are not achieved by buffing of other basis metals such as copper or steel.

There is no generally accepted theory regarding the mechanism by which breakdown of electrodeposits occurs. Undoubtedly the condition of the basis metal is a major factor in electrodeposit resistance to corrosion, but "condition" is a vague term which needs more accurate definition.

Corrosion Testing

Mr. Pinner emphasized the need, in the metal finishing industry, of a non-destructive test that would predict corrosion resistance. Our present tests result in destruction of the test piece. This is an economic loss, although a justifiable one in mass production. More important is the effect on research studies—because the point where corrosion starts is destroyed in the test, and there is no way of studying that point to determine why it was weak.

Even a destructive method of corrosion testing, both rapid and reliable, is needed by the industry. The salt spray test is not only limited in reliability, but has been shown to be non-reproducible and has further been proved to fail to predict service behavior in many environments. However, there is nothing better to replace it at the present time.



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Compare these advantages! The Hartford fully enclosed Model 1956 is extremely compact... requires less floor space than most enclosed barrels. With Hartford the power unit is on top, where it belongs for long life, cleanliness and ease of maintenance. Barrel is mounted on rugged "A" frame for maximum strength. Streamlined steel enclosure confines splash and contributes to safe operation. Pivoted front guard opens to permit quick, easy loading and unloading . . . plus easy removal of barrel assembly. Standard power unit has four speed gear shift transmission. Literature and prices promptly furnished.

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FILTER OUT your plating troubles!

Take good care of your plating solution and you'll get better work out of it; brighter coatings, improved adhesion, less loss of costly anode metal.

Start CLEAN... Stay CLEAN

Baby your bath, by filtering it regularly with Red Label Darco S-51, the activated carbon made especially for electroplaters. Darco is the efficient and economical way to remove trouble-making impurities. It contains no traces of sulphides that can cause dullness, brittleness or poor adhesion. It wets easily . . . minimizes dust problems.

Be sure to specify Red Label Darco S-51 by name. Get it from your supplier in convenient 10-lb. and 50-lb. packages.

Write for a copy of the article,
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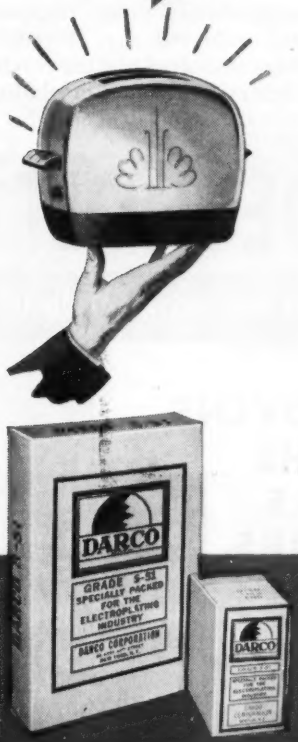

Chemicals Division
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE, U.S.A.
ATLAS POWDER COMPANY, CANADA, LTD., BRANTFORD, CANADA

Influence of Basis Metal

Basis metal surface condition has a pronounced effect on corrosion resistance. It is also a factor in other phases of plate quality, such as smoothness. Particularly important are foreign inclusions and other imperfections. Mr. Pinner expressed an opinion that the method of fabrication of the original surface, as by stamping, drawing, polishing, or electrochemical means, also affects the quality of subsequent electrodeposits. Abrasive polishing may leave on the surface debris and slivers which are difficult or impossible to remove.

Electropolishing treatments are reasonably effective for surface cleaning, but may open up cracks that could otherwise have been harmless. Electropolishing may also cause damage to certain types of dirty steel surfaces.

Ductility

Organic-type bright nickel deposits of greatly improved ductility are needed, and research in this field is currently active. Mr. Pinner pointed out the benefits of bright nickel deposits on articles not subject to physical distortion, such as door handles and radiator ornaments. On objects that may be deformed in use, including automobile bumpers, present bright nickel deposits do not possess sufficient ductility, although they may be deposited over a different metal of high ductility. Even when ductile bright nickel deposits have been achieved, by favorable and highly controlled plating conditions, subsequent chromium plating results in nickel embrittlement.

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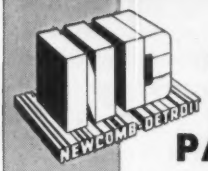

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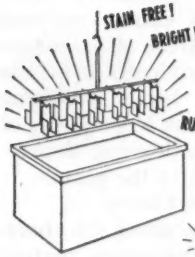
Magic Dry

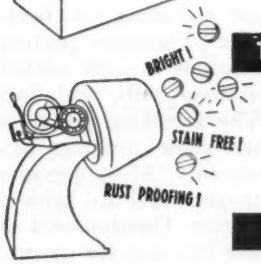
Your answer to *Trouble-Free* PLATING

by Eliminating { STAINING / DULLNESS / RUSTING



PLATING

MAGIC DRY is a remarkable new product that helps eliminate rejects and increases production. In plating, MAGIC DRY is used in the rinse cycle in concentration of 1-2 ozs. for every 10 gallons of water 160° to 180° F. MAGIC DRY will eliminate plating stains and maintain the bright finish of the plated work. It will also provide a rustproofing finish that will be welcomed by the plating industry.



TUMBLING

Four ozs. of MAGIC DRY per gallon of water applied to tumbled parts at room temperature immediately after tumbling retains the bright finish of the tumbled parts and thereby prevents them from rusting or staining.

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When one oz. of MAGIC DRY is added to each gallon of Alkali cleaner, many difficult cleaning problems become a matter of routine.

MAGIC DRY is now available in 55 gallon drums or 5 gallon containers.

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Please send me FREE sample of MAGIC DRY.
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QUALITY PRODUCTS OF CHEMICAL RESEARCH

Cyanide Copper

Cyanide copper plating solutions are widely used, but little is known of the exact composition of such baths, especially with respect to the chemical linkages among copper, cyanide, and sodium ions and complex ions. Further knowledge of this subject would be of practical benefit to the plater. Mr. Pinner also discussed the difficulty of obtaining smooth deposits of copper in thick plates.

Elimination of Roughness in Nickel Deposits

Dr. S. Wernick confirmed the unsolved problems by Mr. Pinner, and listed several additional problems of international interest. First of these was the elimination of roughness in thick nickel deposits. Increased thickness is used to overcome porosity, but the inevitable increased roughness itself becomes a cause of rejection.

Other disadvantages of roughness were also listed by Dr. Wernick. The foreign particles or discontinuities that cause individual roughnesses are apt to be sites of local corrosion. Excessive roughness necessitates buffing to produce the required smoothness; this is an added production cost, and it causes reduced nickel thickness. Areas of roughness may be weak mechanically as well as electrochemically, hence polishing operations may break loose pieces of the electrodeposit, leaving depressions or even holes in the plate.

Chromium Plating

Dr. Wernick discussed the shortcomings of the chromium plating process. Chromium is still plated from the chromate bath, with low efficiencies. The throwing power is poor, although some progress has been made recently. Most deposits are highly stressed, and are subject to crack formation. Development of a non-chromate solution for chromium plating would be of great benefit to both decorative chrome and hard chrome platers.

TRUE BRITE BRASS SOLUTION

A foolproof solution which has been in use over 6 years in light and heavy production.

- Ready To Use—Just Add Water
- No Variance in Color
- Trouble-Free—Little Supervision Needed
- Low Cost—Additions only once a day

Available in a variety of colors. Will match your sample.

Write for technical bulletin and prices.

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MASKING TAPE
DIE-CUT TO YOUR EXACT SPECIFICATIONS FROM
SCOTCH BRAND
INDIVIDUAL PIECES • ANY SIZE OR SHAPE
For quick, accurate masking operations.
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a 3 cent investment

that will pay off

Here's how you can profit by investing a three cent stamp to mail the coupon below: By return mail you'll receive demonstration samples showing the difference a small amount of Nacromer added to your regular coating material* will make in your finish. You'll see how Nacromer creates new and completely different effects that will do wonders for your products. You'll learn, too, that Nacromer can be used on metal, wood, plastic, glass, paper . . . practically any material, and, that it requires no change in your present finishing method — brush, spray or dip. Best of all, you'll see that such a small quantity of Nacromer is required that the cost is negligible. But, why not see for yourself? Simply check the material you finish and mail the coupon today. Your 3 cent investment will pay off.

YOUR REGULAR COATING MATERIAL + NACROMER = A UNIQUE FINISH

** Nacromer is not suitable for use in pigmented enamels, high temperature bake-type synthetic resins containing formaldehyde, or paints. It is suitable for use over these coatings in a clear eanmel or lacquer.*

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Please send a demonstration sample of a Nacromer finish on

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Question: *We are engaged in production of various military equipment in which we use a number of electronic components that are silver plated, and which are not necessarily always protected when received from vendors. Can you advise us in regard to the following questions:*

(a) How should we handle the pieces in stocking and in assembly processes to prevent tarnishing?

(b) Can you verify that tarnishing is not a destructive corrosion process?

(c) We have received some components (connectors) which are sealed in polyethylene bags, yet a short time after we receive them, some of the units are tarnished. The seals appear to be air tight upon checking. This would appear due to previous handling by the packers at the vendor unless there might be a vapor transmission characteristic of the polyethylene.

R. G. L.

Answer: In attempting to provide a reply for your question (a), we might suggest that in stocking and assembly, silver plated parts should be handled in a moisture free atmosphere, if at all possible. Perhaps you could specify that your vendors supply the parts coated with transparent lacquer to prevent tarnish. If this is not possible, you might specify that they be shipped with moisture absorbers similar to the silica gel units used to remove moisture from aircraft engine components, for example. The assembly of silver plated components should be done so as to avoid skin contact, if possible. Silver is a very sensitive metal and will tarnish easily.

The answer to your question (b) can be much more direct and simple. Tarnishing of silver is definitely a corrosion process. It is the formation of complex silver sulfides and other compounds on the surface of the silver. When the tarnish is removed, either by chemical or mechanical means, or a combination of both, some of the silver surface is removed at the same time.

With regard to your comment (c), it would appear that you should ask your vendors to go one step further and seal the connectors in the polyethylene bags with dessicant or moisture absorbing materials. Even then tarnish might not be eliminated entirely because, as you point out, previous handling by packers may be responsible for tarnish noted upon receipt of the product.

——— *fc* ———

Question: *We process steel products to produce black finishes. Sometimes it is necessary to clean and pickle steel parts to remove heavy scale or rust. We have difficulty with a black carbon smudge which remains on the steel parts after pickling. Any suggestions*

CLINIC

as to how we might we remove this smudge would be appreciated.

C. T. P.

Answer: It is quite possible that inhibited acids might have less tendency to form this carbon smudge than your present process.

Another possibility which you might check is that of tumbling the steel products with trisodium phosphate powder and sawdust in an ordinary tumbling barrel to remove the carbon smut.

To prevent the formation of the troublesome carbon smut, you might also like to investigate some of the alkaline rust removers to be used for treating the steel parts prior to processing through the black oxide finishing cycle.

——— *fc* ———

Question: *In your March 1955 issue in the "Finishing Clinic" section, you refer to a strippable coating for application to metal during various manufacturing operations.*

We would appreciate receiving further details of this material.

J. N.

Answer: Thank you for your letter inquiring concerning a strippable plastic coating for application to metal during manufacturing. We are referring you to several manufacturers of this type product.

With reference to the material itself, the products are clear liquids which can be sprayed with an ordinary spray gun upon the metal surface to be protected. The sprayed film dries quickly, forming a transparent, abrasion resistant coating which can remain on the metal until such time as the manufacturer or even the consumer desires to remove it. It can then be peeled from the metal surface in a continuous sheet or in smaller strips.

——— *fc* ———

Question: *We are manufacturers of residential lighting fixtures and have encountered a problem in finishing.*

We manufacture a certain item which is made of aluminum and we have a very large demand to have this finished in a polished shiny brass finish. We have also had a large demand asking us to finish this aluminum in a copper finish. In making this item up, the finish tarnishes when it is finished in brass or copper and we are wondering if you can give us any information as to the proper method of making these two finishes on aluminum.

A. S.

Answer: We have your letter discussing your problem in connection with the tarnishing of copper and brass plate over aluminum.

It is quite possible that you will find it necessary to protect the copper and brass finish obtained by coating your products with a clear lacquer or a baked paint finish. We are referring you to several manufacturers of paint products for this purpose.

Practical Applications of modern products

Masking With a Spray Gun

By MYRON C. BRYANT
Better Finishes and Coatings, Inc.
Newark, New Jersey

Sprayed-on strippable coatings for protecting work-in-process have come to be widely used in a variety of industrial applications. Thereby hangs a tale of World War II technology successfully adapted to civilian industry.

When American fighter plane production swung into high gear, a critical problem arose. How to deliver thousands of urgently needed planes to the fighting fronts? Bombers could be flown overseas. But fighters had to be shipped as deck cargo. Quickly-removable, interim protection was vitally needed. Better Finishes and Coatings, Inc., 268 Doremus Avenue, Newark 5, N. J., developed "Liquid Envelope" strippable coatings as a solution to the problem.

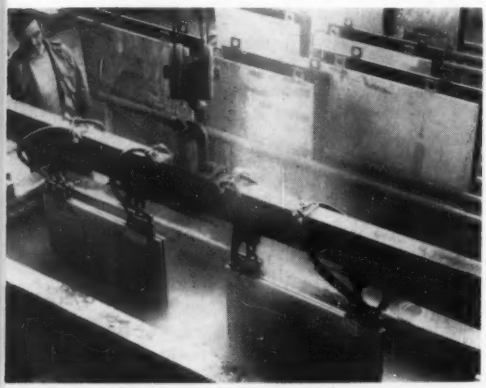


Fig. 1—Nickel clad steel plates coated on one side with a strippable coating enter one of the metal preparation tanks prior to electroplating. Only the exposed, or uncoated side of the sheet is plated.

Today, vinyl strip coatings are commonplace. Fifteen years ago they were a brand new world. How to make an impervious vinyl coating that would stay put and withstand every conceivable exposure, yet be freely strippable months later, was a real $64 question. After "Liquid Envelope" was developed, thousands of fighter planes were flown to ports of embarkation, spray coated with this material, and loaded aboard ship. Overseas, the "Liquid Envelope" was peeled off and the plane made ready for combat within a few hours after being set ashore. After the war many more millions of gallons of "Liquid Envelope" were sprayed on to "mothball" Navy ships, planes, ordnance, and vehicles.

Such substantial use of the strippable coating attracted industrial users. Today "Liquid Envelope" is being widely used for many industrial interim-protection jobs which a strip coating can do better, faster and cheaper than anything else. Uses are so many and so varied as to defy orderly cataloging. So we can cite only a few, which in turn may stimulate your imagination on how you can use strip coatings in your operations.

Simple and obvious is the use of "Liquid Envelope" Spray Booth Coating. Keeping spray booths clean and firesafe is perhaps the meanest job in

the finishing room. Overspray will accumulate on walls, ceilings and ventilators. It's the prime fire hazard. Scraping down is costly. In contrast, spraying "Liquid Envelope" Spray Booth Coating on a clean booth is simple and fast. When overspray accumulates, the strip-coating is peeled off in minutes along with all accumulated buildup. Walls and ceilings are clean again. Respraying takes only minutes.

Production operations frequently necessitate masking large areas with a stop-off prior to plating or applying baked enamel coatings. This is particularly true with regard to machined surfaces, during or after assembly of components.

Special "Liquid Envelope" formulations have been developed that are impervious to nickel, chromium, copper, brass, bronze, alloy and precious metal plating solutions. They are designed for use where economical protection or large-area masking is necessary. Currently, they are being used as stop-off coatings during the electroplating of clad steels, special castings, bearings, dies, tools and on various other industrial and consumer equipment parts. They afford excellent impermeable coverage and clean strippability.

"Liquid Envelope" Stop-Off 3275 is a general purpose stop-off that has the physical properties and adhesion found to be most acceptable throughout custom and job plating shops. It is not adversely affected by usual bath temperatures. A 3-5 mil film is usually sprayed on and manually stripped after plating operations are completed.

"Liquid Envelope" Stop-Off 3320 is a coating especially formulated for protecting rough metal surfaces, such as coarse clad steel (Fig. 1) during electroplating operations. It is a high-solids formulation with adhesion regulated so as to be freely strippable from rough, porous surfaces. Spray application to produce a dry film of 3 to 5 mils in one application protects surfaces in the plating bath. The film strips freely after plating applications (Figure 2).

"Liquid Envelope" Stop-Off 6626 will withstand two 10-minute baking cycles of 375 deg. F., and therefore can be used in finishing operations where a coating must be baked several times, but where it is also necessary to mask off certain areas. With proper reduc-

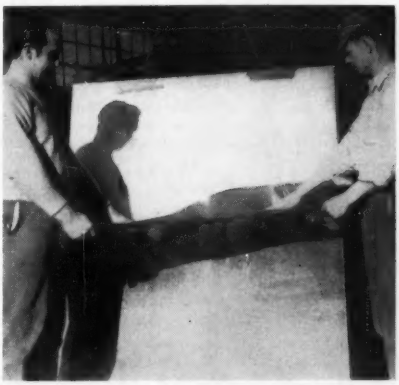


Fig. 2 — Strippable coating being removed from nickel clad steel sheet after electroplating. The nickel faced surface is then spray coated with another strippable coating to protect the polished surface during shipping and storage.

tion, this formulation may be sprayed, or it can be brush coated to produce a film thickness of 4 mils.

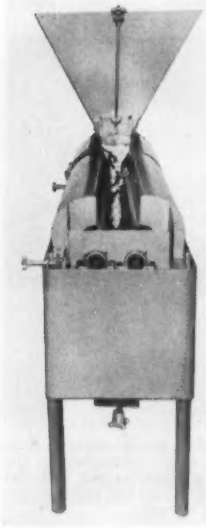
Another use is in the aviation industry where aluminum sheets are sprayed with "Liquid Envelope" on one side only prior to dipping in zinc chromate primer. Still another is its application to aluminum door frames and windows prior to installation in commercial buildings. The "Liquid Envelope" strip coating protects the aluminum against alkali corrosion during wall plastering. Still another is the protection of formica table tops during the assembly and shipping of breakfast-room furniture. This use in turn prompted further use of "Liquid Envelope" to protect electronic subassemblies during subsequent assembly operations in the electronics industry. The automobile industry is a large user to protect stainless steel moldings during forming operations, and to protect instrument panels.

In fact, it can be said that wherever finished surfaces require protection during fabrication, assembly and shipping, there is probably a place for "Liquid Envelope" strip coating. Masking-with-a-spray-gun is already big business, but the opportunities for reducing spoilage and reducing costs by this technique are far from being fully explored.

For more data circle 1 on Reader Service Card

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

For further data on products mentioned in this issue, use READER SERVICE CARD inside back cover.



ESBEC DIMENSIONAL SEPARATOR

Handles Difficult Separations Automatically

No Hand Picking . . . Easily Adjusted

Examples of the jobs performed by this radically different separator:

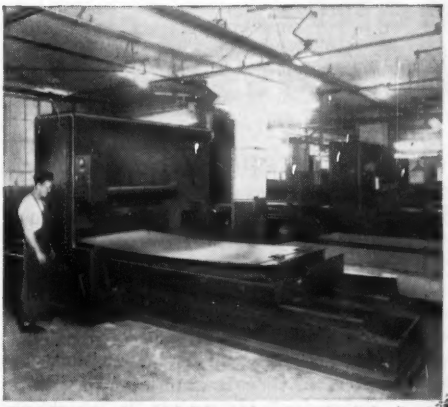
Needles and needle-like parts from steel balls.
Non-ferrous parts from chips of the same general size.
Ferrous parts from ferrous media.
Flat parts or chips from round ones.
Thin flat shapes from thick pieces of the same length and width.
Dissimilar parts which have been mixed by accident.
Flat chips which cannot be screened from the chip load but which are subject to wedging in parts.
Mixed loads of steel media to eliminate sizes which might wedge, but which cannot be screened.

Write today for complete details.

TUMBLING SALES & SERVICE CO.

Field Engineered Barrel Finishing Equipment

100 BEECH STREET **BYRAM, CONNECTICUTT**



HILL Sheet Grinder and Polisher with reciprocating hydraulic table processing individual sheets.

HILL

GRINDING and POLISHING MACHINES

How much is it costing you to produce ACCEPTABLE finishes on FLAT surfaces

HILL Pinch Roll Grinder and Polisher for "Wet" or "Dry" operations. (Shown in series for straight line production)

HILL 2-Roll Vertical Abrasive Belt Grinding and Polishing machines are the logical result of 25 years of research and experience in producing self contained units for successfully processing ferrous and non-ferrous sheets. We have consistently proven that wide abrasive belt grinding and polishing equipment must incorporate these fundamental features — rugged construction, simplicity of design, accessibility, versatility and centralized controls.

HILL abrasive belt polishing machines are recommended for continuous operation and insure lower production costs with superior finishes as required today by the manufacturers of decorative plastics, food processing equipment, automobile bumpers, lithographers and photo engravers plates, home appliances, etc., etc.

Both types of machines are normally built up to 60" wide, and larger capacity equipment can also be furnished.

Your inquiries are solicited for detailed information and recommendations.

TOOLS FOR INDUSTRY

THE HILL ACME COMPANY

1209 WEST 65th STREET • • • CLEVELAND 2, OHIO

"HILL" GRINDING & POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING • THREADING TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • BILLET SHEARS • PORTABLE FLOOR CRANES • "CLEVELAND" KNIVES • SHEAR BLADES

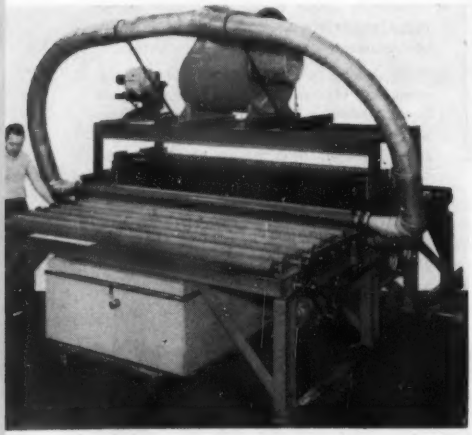
New Equipment, Materials, Processes

Sheet Metal Scrubber

The Fuller Brush Co. has announced a mechanical washing machine which aids in ensuring complete, overall and uniform cleaning of oil or loose surface deposits from both sides of sheet metal.

The metal moves along feed rolls into a hood where it is sprayed top and bottom with a heated detergent and scrubbed between a pair of brushes. Spraying by the same detergent is repeated as the metal proceeds between a second pair of rotating brushes. It is then sprayed with a clear water rinse top and bottom. Finally, it passes between two air manifolds, where a blast of air acts as an air squeegee to clean and dry the metal. The plate moves onto a series of rolls which act as conveyors. Another model of the machine has two scrubbing stations and provides a rinse scrub as well.

For more data circle **2** on Reader Service Card



Sheet Metal Scrubber

Germanium Rectifier

An improved 1000 ampere germanium plating rectifier has been announced by the General Electric Rectifier Department at Lynn, Mass.

Compact and lightweight, the germanium units need no special foundations. A minimum of moving parts and an absence of aging in the elements are features of these germanium rectifiers.

Down-draft air cooling, in which air is drawn in horizontally through the front panel, minimizes dust and dirt intake. Single-knob, fingertip control simplifies adjustment.

Complete control flexibility with the germanium plating power supply permits the addition of automatic control in the future without replacement of the manual control.

For more data circle **3** on Reader Service Card

★ ★ ★

Porcelain Enamel for Aluminum

Development work on a non-toxic, chemically resistant vitreous frit for porcelain enamel which can be fused to aluminum and its alloys has been announced by Minnesota Mining and Manufacturing Company.

The lead-free frit, now beginning to be field tested, is being developed as a decorative finish for aluminum. Contemplated uses include interior and exterior porcelain enamels used on building and decorating materials; household appliance finishes; and finishes for airplanes, cars, ships and boats.

The company reports that initial field tests indicate that porcelain enamel made with this frit is non-toxic; will not flake or chip when cut or saw-

ed; retains its gloss under adverse weathering; resists abrasion; protects against corrosion; can be sprayed or dipped; covers large areas per pound because of a low density; and can be produced in a variety of colors.

The material is available at present in pilot-plant quantities for testing.

For more data circle **4** on Reader Service Card

★ ★ ★

Hammer Finish

Barcoloid, a one coat hammer finish pigmented with aluminum has been announced by the Barrett Varnish Co., 1532 S. 50th Ct., Cicero 50, Ill. It is available in 25 standard colors and can be baked or air dried. Advantages cited by the manufacturer for this material are good scratch resistance, durability, pattern consistency, and easy application in high production. Data sheets and color booklets are available from the Barrett Varnish Company.

For more data circle **5** on Reader Service Card

★ ★ ★

Heavy Duty Vapor Degreaser

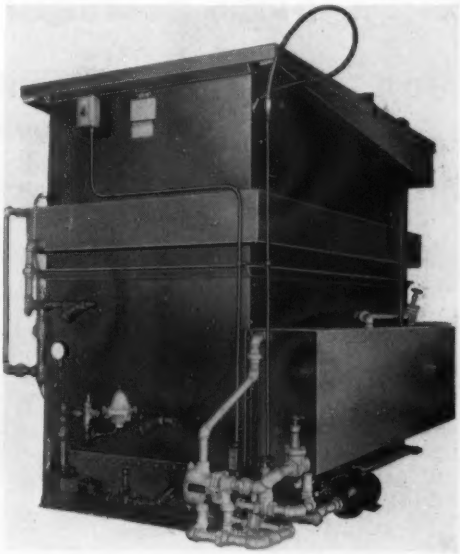
Phillips Manufacturing Co., Chicago 45, Ill., has announced a degreaser to meet the need for degreasing parts or assemblies heavily laden with very thick soil, soluble, insoluble, or both. This heavy duty degreaser has been developed in order to solve the problem of draining off heavily contaminated vapor degreasing solvent, permitting longer operation between cleanout.

The use of this type of degreaser is indicated wherever there is a heavy maintenance and repair problem.

A double sump provides the key to the heavy duty feature of the machine. One of the sumps contains the heating element which brings the solvent to a boil. The other sump is a depository for the contaminated solvent which runs off from a drain plate above the boiling sump. A removable sludge pan is located in this settling sump. Heavy particles settle out into the sludge pan, leaving the relatively clean solvent free to return to the boiling sump for reuse. The sludge pan can be removed, emptied and replaced with a minimum interruption in work. A flusher pump and spray can be installed to flush out soil from recesses.

The unit is available in four different standard sizes, handling work requirements from 4,000 to 12,000 pounds per hour. Special sizes and requirements can be made to order. Electric, gas or steam heated units are available depending on requirements. A constant level solvent control admits clean solvent as required from the storage tank. A piping by-pass permits rapid recharge of the degreaser.

Vapor level is controlled by means of a water jacket. Automatic shut-off



Heavy Duty Vapor Degreaser

controls for protection against overheating are provided where required. The units are of arc-welded steel plate constructions reinforced, metallized and painted on the exterior with solvent resistant paint.

For more data circle **6** on Reader Service Card

★ ★ ★

Acid Mist Suppressor

Fluorochemicals have been used in formulating a material to reduce acid mist and spray from chromium plating baths, according to a joint announcement of the Udylite Corp., of Detroit and Minnesota Mining and Manufacturing Co., of St. Paul.

It was pointed out that fluorochemicals are not affected by the highly oxidizing condition encountered in a chrome plating bath.

The 3M fluorochemical is incorporated by the Udylite Corporation, in "Zero-Mist," a surface-active additive for decorative chromium plating baths.

The Zero-Mist pellets, when added to the bath, create a yellow foam blanket that floats on the surface of the bath and prevents the escape of chromium mist.

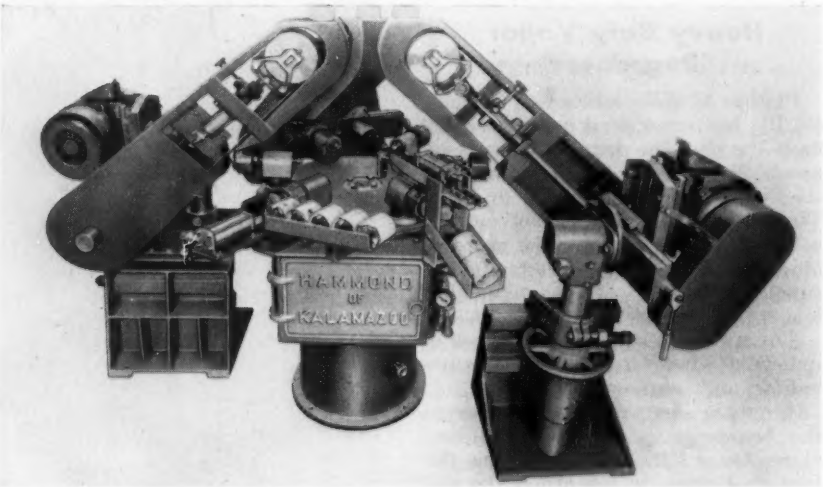
The Udylite Corporation reports that "Zero-Mist" cuts chromic acid waste; reduces dragout losses; eliminates chromic acid mist and spray; is stable at all temperatures and in all concentrations; eliminates washing of exhausted air, and requires additions only to replace dragout losses.

For more data circle **7** on Reader Service Card

★ ★ ★

Rotary Automatic Polishing Machine

Hammond Machinery Builders, Inc., Kalamazoo, Mich., has announced Model J-34-6 Indexing Rotary Automatic, an automated chamfering machine for deburring piston skirts. Au-



Model J-34 Indexing Rotary Automatic with three Model 50-81 C-4120 Abrasive Belt Heads set up for deburring skirts of aluminum pistons. Machine is equipped for automatic loading and ejection.

It's Fast
It's Thorough
It's Economical

It's your Best Buy in Degreasing Agents!

Nialk® TRICHLORethylene

When you stack up all the advantages offered by Nialk TRICHLORethylene you'll understand why more and more companies are standardizing on it for metal parts degreasing.

Versatile—the ideal organic solvent for removing practically every kind of foreign matter—waxes, greases, oils, gums, tars—even chips. Leaves parts clean, warm, dry, ready for assembly, inspection or surface treatment.

Fast—Acts quickly, cleans and dries rapidly. Its low boiling point (86.6°-87.8°C, based on standard ASTM tests) permits vaporization at low steam temperatures.

Thorough—Low viscosity (0.58 centipoises at 20°C) and low surface tension (about 29 dynes per cm at 30°C) assure diffusion into pores and relatively inaccessible openings.

Economical—Stable and completely usable after distillation. Cuts power consumption . . . can be heated by gas, steam or electricity. Gives concentrated vapor at only 188°F. Specific heat is less than ¼ that of water. Cuts vapor loss—high vapor density (4.5 times that of air) assures proper vapor level at all times.

Safe—Has neither flash point nor fire point; classed as nonflammable at room temperatures, only moderately flammable at higher temperatures (Underwriters' Laboratories rating 3).

Order by the drum, carload or tank car. Deliveries can be made promptly. A request on your letterhead will bring you a free copy of our Nialk TRICHLORethylene booklet.

NIAGARA ALKALI COMPANY

60 East 42nd Street
New York 17, New York

NIALK® Liquid Chlorine • NIALK Caustic Potash • NIALK Carbonate of Potash
NIALK Paradichlorobenzene • NIALK Caustic Soda • NIALK TRICHLORethylene
NIAGATHAL® (Tetrachloro Phthalic Anhydride)

tomatic pneumatic loading and ejection are featured on this machine.
For more data circle **8** on Reader Service Card

★ ★ ★

Trouble Shooting Chart

The Joseph B. Kushner Electroplating School, Stroudsburg, Pa., has announced the Tank Doctor, a trouble shooting chart for electroplaters and plating department control chemists.

The Tank Doctor gives in systematic order, the symptoms, the diagnoses, and the cures for many difficulties that come up in the operation of the specific tank for which it is designed. The chart is 8 by 10 inches so that it is quickly scanned by the eye, yet it is comprehensive in detail.

The Tank Doctor, printed on rigid, opaque white vinylite sheet stock, is impervious to water, fumes, and the acids and other chemicals commonly found in the plating room. It is designed so that it can be permanently mounted at the plating tank or control panel for convenient consultation or reference.

Three types are available: the Chromium Tank Doctor, the Nickel Tank Doctor, and the Copper Tank Doctor.
For more data circle **9** on Reader Service Card

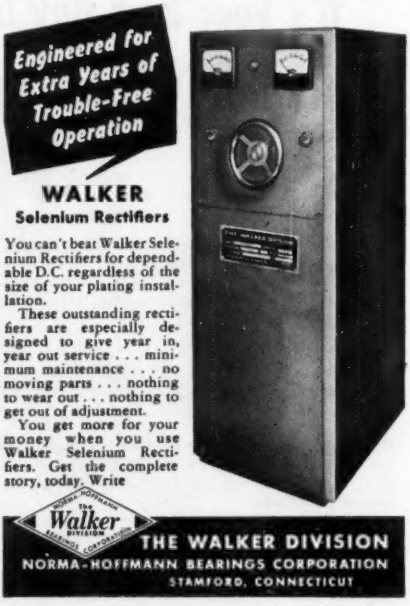
★ ★ ★

Deep Draw System

The Watson-Standard Company has announced a system of coatings specifically formulated for use where deep drawing is required.

This system, available in black and white, includes Watson-Standard Size 17-265, Watson-Standard White P926-8B, Watson-Standard Black 17-264 and

THERE'S NO SUBSTITUTE FOR
DETROIT "TAC" RAGS
IN YOUR FINISHING DEPARTMENT
DETROIT
HANDY
"TAC"
RAG
PICKS UP DUST
LIKE A MAGNET
DETROIT "TAC" RAGS are an absolute necessity for cleaning any metal, wood or plastic surface before painting. Removes all dust, lint and sanding particles.
Order today through your supplier.
STANDARD OF THE FINISHING INDUSTRY SINCE 1934
DETRO MFG. & SALES CO., INC., CULVER CITY, CALIFORNIA


Engineered for Extra Years of Trouble-Free Operation
WALKER
Selenium Rectifiers
You can't beat Walker Selenium Rectifiers for dependable D.C. regardless of the size of your plating installation.
These outstanding rectifiers are especially designed to give year in, year out service . . . minimum maintenance . . . no moving parts . . . nothing to wear out . . . nothing to get out of adjustment.
You get more for your money when you use Walker Selenium Rectifiers. Get the complete story, today. Write
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THE WALKER DIVISION
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Burnek 22 provides better luster, savings in time and money at Lufkin Rule Co. Lufkin also uses Wyandotte 444-C, for stripping paint from steel tape.

How to get brilliant luster at lowest cost

Use Wyandotte's Burnek 22, says Lufkin Rule Co., Saginaw, Mich. Here's why:

A continuous search. The Lufkin Rule Company burnishes all brass spring joints on its rulers before their final assembly. In a continuous effort to improve the results of the finishing operation, the company had tried a wide range of burnishing compounds, including soap chips, but without sufficient success to meet their standard of quality. Recently they switched to Wyandotte's BURNEK 22.

Change for the better. "BURNEK 22 gives us better luster than we've been able to get with any other product," says Divisional Superintendent J. H. Farmer. "And it dissolves completely . . . faster. Rinsability? Excellent! It's easy to get really clean parts with BURNEK 22."

Burnishing costs have been substantially cut at Lufkin Rule because, they report, BURNEK 22's easy rinsing and solubility have saved time and money. They use less water for rinsing. And a little BURNEK 22 goes a long way!

A call that will pay. If you're looking for ways to improve your metal cleaning or finishing operations, call your Wyandotte representative today. Wyandotte products are research-developed and production-proved to give you the best results . . . at lowest use-cost. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, Calif. Offices in principal cities.*

Wyandotte
CHEMICALS
J. B. FORD DIVISION
SPECIALISTS IN METAL-CLEANING PRODUCTS

Watson - Standard Finishing Varnish 13-952A.

According to the manufacturer, this system not only exhibits excellent fabrication qualities but is also highly chemical resistant, particularly to alcohols. It is ideal for aluminum whiskey cap seals. The fine buffing characteristics also make it suitable for the manufacture of embossed signs, insignias and nameplates.

For more data circle **10** on Reader Service Card

Tumbling Barrel

A heavy duty tumbling barrel has been announced by Tumbling Sales & Service Co., Greenwich, Conn. Several sizes are available, in capacities ranging from 7½ to 45 cubic feet. This group of barrels, known as the Esbec Series HD, uses horizontal closed drums, which may be divided into two or more compartments. Special sizes can be built to meet specific needs.

The drums are of extra heavy construction; thus they can be used for ball burnishing as well as abrasive tumbling. Minimum floor space in relation to capacity is required, and several units can be butted end to end. Overhead, variable speed drive keeps the mechanism away from dampness and abrasives.

Among the safety provisions included on these barrels are fast acting safety doors. These doors incorporate a rapid locking mechanism and are designed to prevent blowing off in case of pressure buildup. The low loading height makes for easier loading and inspection of the load. All working parts are available from the front.

For more data circle **11** on Reader Service Card

CYCLONE SEPARATION
FOR MORE EFFICIENT DUST COLLECTION —FILTERS LAST LONGER
Almost all industrial dusts can be collected more efficiently by Dustkop. Thirty-seven standard models *ready to use!* Reduce installation costs — save space. Write for descriptive literature.
ALSO A COMPLETE LINE OF MIST COLLECTORS
DUSTKOP®
STOPS DUST
AGET MANUFACTURING COMPANY
1390 EAST CHURCH ST., ADRIAN, MICH.

VERSATILITY

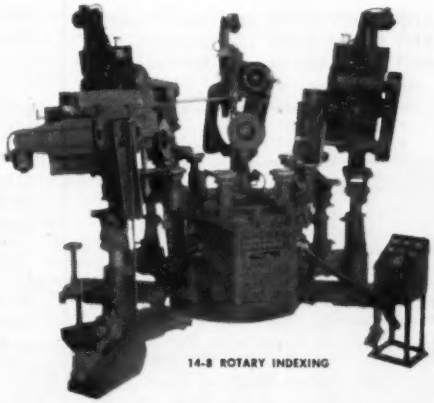
Packer-Matic's ability to handle multiple contour units in short runs is just one of the many sound reasons why cost conscious production men are selecting Packer Automatic Machines to solve their finishing problems.

The Unicycle pictured above depicts versatility in its own right. The Packer-Matic shown below is a perfect example of a modern piece of machinery designed to do many jobs; polishing, buffing or deburring, faster, more economically and with greater uniformity than hand operation.

Packer-Matics are leaders because they are designed specifically to perform a multiplicity of jobs with an efficiency that will increase customer satisfaction and profit.

Send your specifications today to ENGINEERING, for quotation.

THE PACKER MACHINE CO.
MERIDEN, CONNECTICUT



14-8 ROTARY INDEXING

PACKER-MATIC

AUTOMATIC MACHINES FOR BUFFING • POLISHING • DEBURRING

Germanium Rectifiers

Rapid Electric Co., Bronx, New York, has announced the availability of germanium rectifiers. These units are said to give 95 per cent efficiency at full load.

Rapid Germanium Rectifiers feature an oil immersed, continuously variable induction control. Fully motorized, they offer ease of operation combined with tight control to vary the output from zero to full load. Output is controlled by two buttons, which are depressed to raise or lower the amperage. The small amount of heat generated allows junctions to be hermetically sealed, eliminates elaborate cooling systems, and allows the whole unit to be almost completely sealed.

Models are available with from 300 to 50,000 amperes d.c. output.

For more data circle **12** on Reader Service Card

KEEP SPRAY BOOTHS SAFER FROM FIRES!

with the original non-inflammable

BATES BOOTHCOATING #4 (for dry booths)
BATES BOOTHCOATING #5 (water type)
BATES FLOORCOATING (for floors)
at 1940 prices

- Makes frequent cleaning easy
- Paint peels off in sheets
- Saves time and labor in applying
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New Low Prices

15 gallon drums 90¢ gallon
55 gallon drums 80¢ gallon
BATES WATER WASH COMPOUND
275# drums 12¢ lb.
F.O.B. Buffalo, N. Y.

Boothcoating #4—excellent metal-drawing compound
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Our Money-Back Guarantee Is Your Assurance Of Top Quality and Satisfaction

Distributors Franchise Open

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1231 Seneca St. • Buffalo 10, N. Y.

★ ★ ★

Electric Sander-Polisher

A sander-polisher that simulates the motion of hand polishing and sanding has been announced by the Douglas Scott Development Corp., Cleveland, Ohio. This machine, called the Auto-Magic, has a floating type head that operates off a trans-orbital relay and revolves in a multiple of $\frac{5}{8}$-inch orbits. The entire surface of the Auto-Magic head is functional.

As a sander, the Auto-Magic can be used for finishing, feathering, and for removing paints and varnishes. It is stated that as a polisher, it produces a high gloss, leaves no swirl marks, and does not scuff or burn.

For more data circle **13** on Reader Service Card

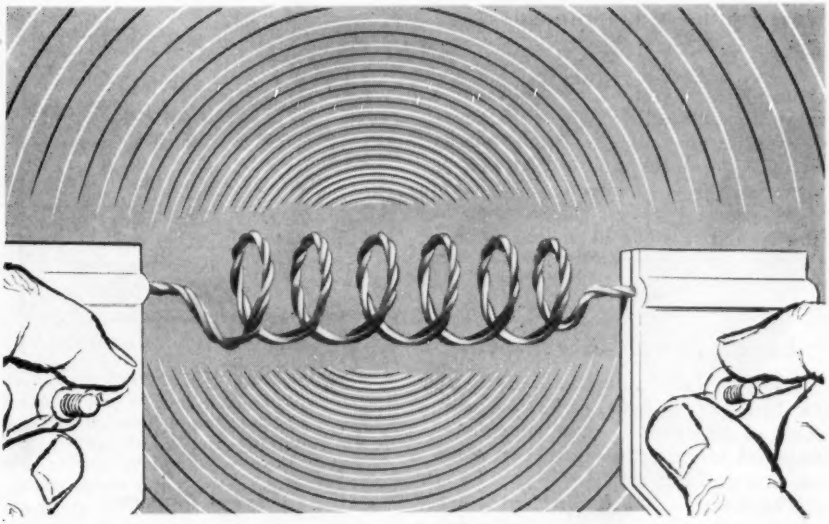
★ ★ ★

Corrosion Resistant Coating

The Pennsylvania Salt Manufacturing Company Corrosion Engineering Department has announced the availability of a low cost trial kit of Thick-Coat, a resin coating product for humid and corrosive atmospheres. This kit, designed for testing purposes, contains two quarts of Thick-Coat, one quart of Pennsalt Lock Prime, a quart of Pennpaint thinner, and complete specifications and directions for use.

The Thick-Coat system provides a protective coating for new or corroded metal, concrete and wood surfaces exposed to fumes, corrosive atmospheres and spillage of destructive chemicals.

Thick-Coat has excellent flow qualities and is applied like regular maintenance paint by brush, roller or spray as it comes from the can. In a three-coat system—one primer and two top



Developed especially for vacuum metalizing to give you top performance at minimum cost!

New Process

SYLVANIA TUNGSTEN COILS and STRAND

New Process Sylvania source heater materials are produced under exacting standards of uniformity throughout every step of manufacture. From tungsten ore to finished coils and strand, every production operation is done in Sylvania's own plants.

Special tungsten wire is coiled specifically for vacuum metalizing to assure maximum evaporating capacity and long service life. Sylvania offers you a wide selection of ready-made tungsten coils, in single or multiple strand, each designed for a specific metalizing application.

If you prefer to form your own source heater coils, there is a full range of wire diameters and types to choose from. Write for your copy of the newly published "*New Process Sylvania Tungsten Coils and Strand*," presenting application and performance data.

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1740 Broadway, New York 19, N.Y.
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St. Catherine St., Montreal, P. Q.

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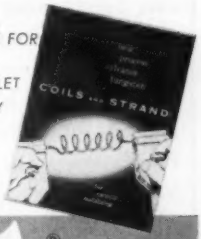

SYLVANIA®

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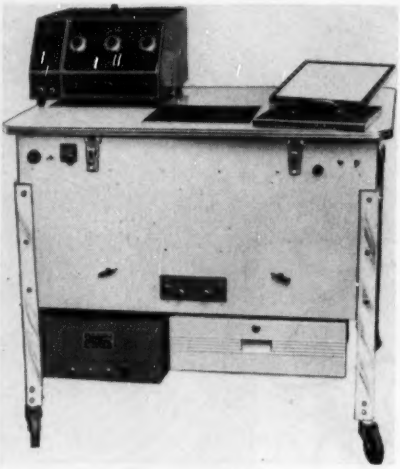
coats—it is reported to build up a minimum of 6 mils dry film thickness. Containing over 60 per cent solids by weight, it assures long-lasting protection on edges, prominences and crevices, as well as on plane surfaces. Thick-Coat is made in several colors.
For more data circle **14** on Reader Service Card

★ ★ ★

Large Area Colorimeter

Gardner Laboratory, Inc., Bethesda 14, Md., has announced the development of a large-area type colorimeter, designed for measuring oversize colored, non-uniform samples.

The design of this instrument is based upon the Gardner color and color-difference meter, the major alterations being the much greater size of the specimen exposure head, and the use of ultraviolet type lamps (black light) as a means of determining the effect of "optical brighteners."



Large-Area Colorimeter

The colorimeter employs approximately a 10 by 12 inch sample area to measure color in the three dimensions of the color solid. It consists of two parts, an exposure head and a measurement or control unit. The sample measuring window is mounted in the center of the exposure head, with the standardizing controls. Readings are taken from the separate automatic control unit. Noviol type ultra-violet filters are provided in the incident beams which may be inserted or withdrawn so that the incident beam of incandescent light may, at the operator's option, lack or possess its normal complement of ultraviolet energy. Another feature is the fluorescent lamps, with which it is possible to enrich the ultraviolet content of the incident light. This is useful for measuring the reflectance of samples treated with "optical brighteners." With the noviol filters in, a measure of reflectance without any ef-

NICKELITE
BARREL NICKEL BRIGHTENER
cuts brightening costs — concentrated to quadruple strength—shipping weight is cut 275%. You don't ship, store or handle water! No deposits, no carboy returns. A capful is enough for a barrel of nickel.
Nickelite boosts corrosion resistance of barrel nickel 30 to 100% by actual salt spray test.
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The Bigger Difference Brings BIGGER TIME SAVINGS!

YOUR BRIGHTBOY DISTRIBUTOR CAN NOW SUPPLY YOU WITH RUBBER-CUSHIONED STOCK ABRASIVES *MATCHED* TO JOB REQUIREMENTS!

THESE TWO WHEELS MAY *LOOK* ALIKE. But in your shop each could have a widely different application. *They're both alike* in that they're both Brightboy. *Either one, or any of the other many Brightboy texture combinations frequently can give you up to 50% in time savings!*

One of these Brightboy Wheels is compounded with SILICON CARBIDE, the other with ALUMINUM OXIDE.

In *both grains* you have wide selection of UNIFORM TEXTURES AND GRAIN SIZES RANGING FROM EXTRA FINE TO EXTRA COARSE, IN SOFT, FIRM AND TOUGH RUBBER BINDERS.

★ YOU CAN NOW CHOOSE A RUBBER-CUSHIONED STOCK ABRASIVE PARTICULARLY MATCHED FOR A GIVEN JOB.

★ YOU CAN LARGELY ELIMINATE THE ANNOYANCE, EXPENSE AND DELIVERY DELAY OF MADE-TO-ORDER "SPECIALS".

★ YOU CAN COUNT ON DEPENDABLE UNIFORMITY, PROMPT DELIVERY.

Brightboy burrs, cleans, finishes, precision-polishes, in one fast operation. A Brightboy finish frequently serves as the final polish. Rubber and abrasive, working together, give Brightboy scope and adaptability far beyond other methods—give you a new, wider, almost unbelievable concept of finishing. Alert production men now explore Brightboy applications as regular routine prior to the setting up of new work jobs.

Ask your dealer NOW for details on multi-use Brightboy, and for the new Brightboy catalog. Advise us if he cannot supply you. Write us on any problem where finishing is involved.

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Brightboy
RUBBER CUSHIONED ABRASIVES

BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER CO.
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America's Pioneer Manufacturer of Rubber-Bonded Abrasives

fect from the optical brightener is obtained. With the filters out, the ultraviolet source may be used alone to measure fluorescent intensity. Since both measurements are made separately upon the same specimen, an objective indication of the effectiveness of the brightener is obtained.

For more data circle **15** on Reader Service Card

★ ★ ★

Cloth Mesh Sandpaper

A mesh-type waterproof coated abrasive product resistant to filling and loading has been added to the line of industrial sandpapers manufactured by Minnesota Mining and Manufacturing Co., St. Paul 6, Minnesota.

Cloth Mesh Sandpaper

Called Wetordry "Fabricut," the material is composed of a cloth mesh coated on both sides with mineral grains bonded to the cloth with a heat-resistant, waterproof resin.

The product is available coated with aluminum oxide or silicon carbide mineral; and it can be used for either wet or dry sanding, by hand or machine.

"Fabricut" has a "self-cleaning" action which minimizes filling, as the stock being removed passes through the openings in the mesh. If the mesh does become clogged, it can be blown clean with compressed air.

The material is available in coarse to fine grits, ranging from 100 to 400. Roll sizes run up to 2½ inches in width; disc sizes are included up to 18 inches in diameter; and several standard sheet sizes are available.

For more data circle **16** on Reader Service Card

★ ★ ★

Fingerprint Remover

Development of a material intended to reduce rejection of metal parts caused by corrosion started from fingerprints has been announced by E. F. Houghton & Co., Philadelphia, Pa.

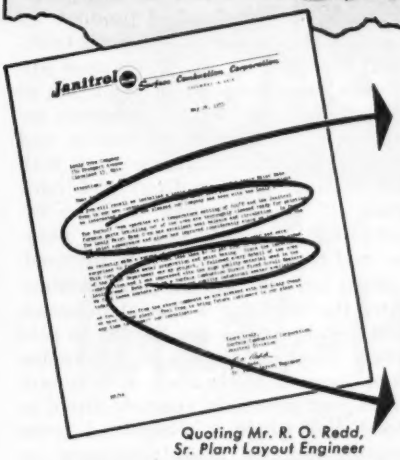
Cosmoline 1070 Fingerprint Remov-

Park No. 290
BLACKENING SALT

Black Oxide finishing for rust resistance and decorative parts. Speedy black coating in water solution with no electric current. Permanent black finish on ordnance parts, tools, aircraft, bearing races. Dazzling black decorative finish for television cameras, business machines, hardware, metal screens and machine parts. Excellent bond for paints and enamels. Simple one bath operation. Write for bulletin H-16. Park Chemical Co., 8078 Military Ave., Detroit 4, Mich.

Janitrol divisions *Surface Combustion Corporation*

COLUMBUS 16, OHIO



Quoting Mr. R. O. Redd, Sr. Plant Layout Engineer

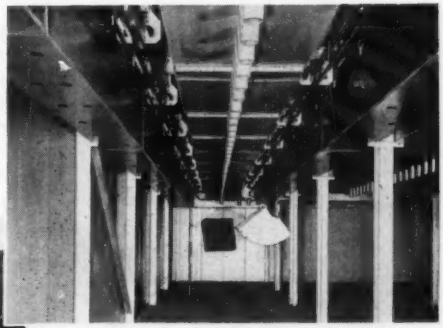
The LANLY Paint Bake Oven

HAS EXCELLENT HEAT BALANCE AND CIRCULATION. IN FACT OUR PAINT APPEARANCE AND GLOSS HAS IMPROVED CONSIDERABLY SINCE WE INSTALLED THE NEW LANLY BAKE OVEN

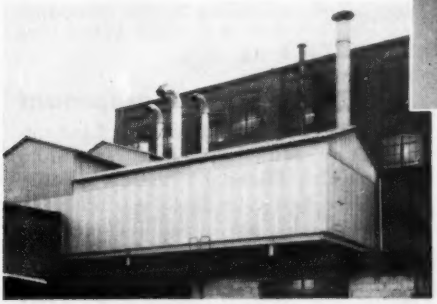
I was impressed with the high quality material used in the Lanly ovens.

Another of the nation's leading manufacturers attests to the efficiency and multi-fold merits of their LANLY OVENS.

Illustration below shows the ingenious manner in which LANLY engineers with the cooperation of The Surface Combustion organization, circumvented the problem of available factory floor space.



Showing a partial conveyor run in the LANLY low temperature paint bake oven.



YOU TOO CAN DO A BETTER JOB WITH LANLY OVENS

Write for the Lanly Catalog

LANLY FINISHING OVENS

THE LANLY COMPANY • 770 PROSPECT AVE

CLEVELAND, OHIO

er is useful in protecting polished surfaces from corrosion caused by the lactic acid, urea and sodium chloride residue of ordinary fingerprints. It is said to be particularly effective on nonferrous metals and bi-metallic parts.

Features of Cosmoline 1070 Fingerprint Remover include the rupture-resisting film it provides to allow safe handling of treated parts, easy removal by solvent prior to application of final finishes, non-toxicity, high anti-humidity properties and stability in storage.

For more data circle **17** on Reader Service Card

★ ★ ★

Porcelain Enamel Pretreatment

A material developed by Parker Rust Proof Company is the key to a method which is said to allow application of the porcelain enamel finish coat directly to ferrous metals.

The company states that the method has produced improved physical characteristics in the finished product. In exhaustive tests, the special metal treatment provided by the Pre-Namel 410 process has produced (1) reduction of coating thickness with consequent reduction of damage from torsion and cross-bending, (2) straighter parts with less bowing between front and back sides, (3) an indication of fewer rejects, and (4) a reduction of the number and types of enamel frits required.

Tests indicate that the process eliminates the need for a special premium base metal; applies successfully to cold rolled rimmed steel and enameling iron; permits application of standard finish coat porcelain enamels direct to steel; and produces completed parts meeting the best acceptance tests for standard porcelain enamel.

Torsion tests, one of the standard tests of the Porcelain Enamel Institute, show that one finish coat of porcelain enamel, applied over Parker Pre-Namel 410 results in improved resistance to twisting.

Application of Parker Pre-Namel 410 may be accomplished in automatic equipment. It is easily and positively controlled, according to the company.

For more data circle **18** on Reader Service Card

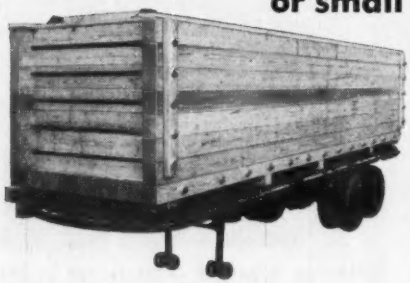
★ ★ ★

Barrel Finishing Equipment

The redesigned Mity-Mite Line, offered by Miller Machine Tool and Gauge Co., Glendale, Calif., includes precision barrel finishing equipment.

Three sizes are available for precision barrel finishing — the 36 inch Double Roll "Stubby," for limited wall space, the 78 inch Single Roll "Long Tom" where center floor space is important, and the "Junior," a small unit suited for instrument makers, laboratories and other manufacturers.

BIG TANKS . . .
or small



Steel mill pickling tank, 30' long, 6' wide, 5' deep. Weight, 33,000 lbs. 8" long-leaf yellow pine, 2" hardwood lining, monel metal fittings.

Kalamazoo
WOOD TANKS
quality-built to your specifications

Free estimates and suggestions

Kalamazoo TANK and SILO CO.
833 HARRISON ST. • KALAMAZOO, MICH.

PLATED WITH

RHODIUM

FOR A BRILLIANT,

Tarnish-Proof Finish

Rhodium-plate **will not tarnish** or lose its high reflective quality. It affords excellent protection against atmospheric corrosion...resists surface corrosion under all atmospheric conditions. This enduring quality gives you a versatile finishing material of inestimable value in decorative, industrial and commercial applications.

For valuable data on other properties and applications of RHODIUM PLATE, write for free detailed booklet.

BAKER & COMPANY, INC. **PRECIOUS METALS**

113 ASTOR STREET, NEWARK 5, N. J.

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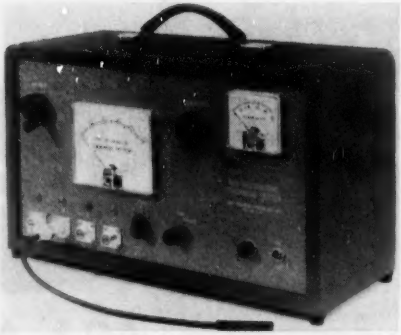
Other units include a "Hot Sawdust Unit" for waxing, polishing and drying of parts, plus an "Unloading and Separating Cabinet" to facilitate easier barrel loading and unloading, and fast parts and media separation. Boom equipment, which allows operators to operate and handle barrel units with a minimum of effort is available as accessory equipment.

For more data circle **19** on Reader Service Card

★ ★ ★



Non-Destructive Thickness Tester

Non-Destructive Thickness Tester

A non-destructive thickness tester for the metal finishing industry has been announced by Unit Process Assemblies, Inc., 75 East 4th St., New York, N. Y. The unit permits inspection of 100 per cent of production, and will test thicknesses of metals deposited on metals, metals on non-conductors, and non-conductors on metals.

This unit is said to give direct readings of thicknesses of virtually any coating on any base, including silver on brass, copper on die castings, nickel on brass, metallizing on plastics, or metallic coatings on ceramics.

The electronic device is compact and portable, permitting uses in almost any location. Thicknesses are read directly from the instrument, and are determined in a matter of seconds.

For more data circle **20** on Reader Service Card

★ ★ ★

Paint Stripper

Octastrip 26, a stripper for use on organic coatings of all types has been announced by Octagon Process, Inc., Staten Island 1, N. Y. Among the finishes for which this stripper is effective are Epons, urea-formaldehyde based formulations, modified alkyds, maleics, nitrocellulose lacquers, wrinkle finishes, cumar resin based finishes, and ester gum and oil based formulations. The material is suitable for application by dip, brush, flow coat and spray methods.

Octastrip is thick enough to cling to overhead surfaces, and thin enough to

MORSE
VERTICAL DRUM TRUCK
ROCK-A-DRUM

Picks up 55 gal. drums, rolls them over for side draining. Becomes a rugged stand on 3" wheels.
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McKeon's "Liquid Sulphur"
Economical, fast, non-electrolytic.
Sulphur Products Co., Inc.
228 McKEON WAY GREENSBURG 6, PA.

SPEED UP PRODUCTION with DOUBLE-ACTION DRYING

Air-dry as you spin-dry with the new, improved New Holland Model 20 KREIDER CENTRIFUGAL DRYER

• Now you can *spin-dry* small parts in continuous *fresh air* in as little as 15 seconds.

Double-action drying with peak-efficiency evaporation gives smooth moisture-free surfaces . . . reduces your finishing problems by eliminating the scarring frequently responsible for costly "rejects."

Your operators will be able to boost production, cut costs way down when you install New Holland's easy-to-run Model 20 Kreider Centrifugal Dryer.

SAFER because of Mechanical and Electrical Control Features!

To unlock cover and remove basket, operator must depress foot brake, stop spinner.

Machine cannot start with open cover. Ample clearance allowed for quick loading.

To start spinner, operator must first close cover completely.

SPECIFICATIONS:

1 h. p. motor—220, 440, 550 volts—2- or 3-phase—spins 75-lb. loads at 825 r.p.m. . . . Quiet V-belt drive . . . 30-blade suction turbine draws air through spinner . . . . Arc-welded steel-plate construction . . . Heavy-gauge woven steel mesh basket . . . Weight: 490 lbs. . . . Floor space: Just under 5 sq. ft. . . . Meets N.F.C. specs. **Optional:** J.I.C. Control: Mounted on right, left side or wall. 160° supplementary heat: 2350-watt Chromalox, or steam.

Send for illustrated 4-page folder. Address Dept. PF-855, New Holland Machine Company, New Holland, Pa.

NEW HOLLAND MACHINE COMPANY
NEW HOLLAND, PA.

flow on. Odor is said to be moderate, and evaporation slow. Copies of a fact sheet on this material may be obtained by writing Octagon Process, Inc., 15 Bank St., Staten Island 1, N. Y.

For more data circle 21 on Reader Service Card

★ ★ ★

Dust Collector

Production of standard models of industrial dust collecting equipment, without the standard dust bin attached, has been announced by Aget Manufacturing Company, Adrian, Michigan. A collector, such as the Dustkop Model 2030 has been useful for many installations where collected dust runs to unusually high volume, or where factory floor space is at a premium.

Dustkop Model 2030

Upon installation of the Dustkop collector, a storage bin is constructed by the customer to meet storage and dust removal requirements, and placed outside the building or inside where space allows. The collector itself may then be located overhead in ceiling girders or on the roof, and connected to the bin by a pipe extended downward at an angle of no less than 45 deg. F. In addition to these standard dust collectors now offered, Aget also manufactures over 37 different models of the Dustkop and Mistkop industrial dust and mist collectors.

For more data circle 22 on Reader Service Card

★ ★ ★

Power Supply for Electrostatic Spraying

Scientific Electric Co., Garfield, N. J., has announced the development of an ionic high potential power supply for electrostatic spray painting. The two-piece, remote-controlled unit, designated as Model HV-140, is Underwriters' Laboratories approved. The power supply unit itself is furnished in a steel tank, which is usually mounted above the spray booth out of reach

FUNCTIONAL FINISHES!!

If you require your coatings to accomplish some specific task — something beyond mere ornamental appearance or average longevity —

Try Us!

We make ACRYLIC, ALKYD, CELLULOSIC and VINYLOID coatings for a very wide range of specialized industrial applications.

The Varnish Products Co.

5204 Harvard Avenue
Cleveland, Ohio

2 Perma-Line ACES

SCIENTIFICALLY DEVELOPED, TIME TESTED, for High Resistance to CORROSION...

A Perma-Line

BRUSHING NEOPRENE

★ *A Low-Cost Maintenance Coating*

A reliable, long life, plant and equipment protective coating, highly resistant to corrosive fumes, oil, splash and weathering. It is easily applied, quick drying and can be used economically on new and old cleaned surfaces of metal, wood or concrete.

This tough, resilient, chemical resistant and high thickness coating has a good maintenance protection record on tank exteriors, ducts, structural steel, and general plant equipment, floors, stairways, etc., when applied in 3 coats at a unit coat thickness of 2 to 3 mils. Available in black or light gray.

A Perma-Line

No. 124

ACID-RESISTANT PAINT

★ *APPLY WITH BRUSH OR SPRAY*

This non-contaminating, easy to keep clean, synthetic resin base, solution type coating has gained wide acceptance — where ordinary paints corrode from acid and alkali fumes and spillage. Used by chemical, pickling, petroleum, plating, food and beverage plants, etc. Easily applied by brush or spray to wall surfaces, structural work, machinery, exterior surfaces of hoods, ducts and processing equipment. Needs no primer, 2 coats generally give complete coverage. Available in green, white, gray and black.

(Not recommended as inside membrane lining for acid storage, plating or pickling tanks or as a floor finish).

PERMA-LINE QUALITY PRODUCTS COMBAT CORROSION IN MANY INDUSTRIES

Perma-Line corrosion specialists are experienced in helping various industries successfully combat their particular corrosion problems, and in planning new installations.

Write us today for information or free literature regarding your specific corrosion problem.

PERMA-LINE
RUBBER PRODUCTS CORPORATION
1753 North Winnebago Avenue
Chicago 47, Illinois

of the operator. The control unit, which is designed for wall mounting, is supplied in an aluminum cabinet and incorporates a special spark-guard for protection against arc-over.

The electronic power supply unit is capable of producing a peak of 140 kilovolts and is designed for use in conjunction with Scientific Electric Super Ionic Guns for electrostatic paint spraying.

For more data circle **23** on Reader Service Card

★ ★ ★

Organic Brighteners

Two organic addition agents for use in acid copper sulfate electrolytes have been announced by Westinghouse Electric Corp., Electroplating Projects Department.

The first, Wes-X 303* acid copper addition agent, is for heavy build-up applications, and is specifically designed for plating record stampers, rotogravure rolls, electrotypes and other electroformed shapes. With this addition agent, it is possible to obtain smooth, dense copper deposits with a fine-grained structure. Plating speeds can be increased with freedom from nodual formation and treeing, the manufacturer states. These advantages can be realized without adverse effect upon other physical characteristics of the deposit.

The second, Wes-X 304 acid copper addition agent permits the deposition of bright, ductile copper for decorative purposes. The deposit is characterized by a high degree of leveling and grain refinement. This addition agent is designed to make possible wider bright plating ranges and use of higher current densities over an extended temperature range.

*Reg. Trade Mark, Westinghouse Electric Corp.

For more data circle **24** on Reader Service Card

★ ★ ★

Magnesium Primer

A primer for magnesium has been announced by the Stanley Chemical Co., East Berlin, Conn., a subsidiary of The Stanley Works, New Britain. Designated as 40X-675, the primer can be sprayed or dipped and has fast-drying characteristics.

Designed to check electrolytic decomposition in assemblies where magnesium is joined to a less active metal, the primer also resists the solvent action of hydraulic fluids in aircraft. It can be applied either to untreated or to chemically treated magnesium.

A film thickness of 1½ mils is said to provide long lasting salt spray resistance. For maximum all-round effectiveness with the primer, Stanley recommends vinyl topcoats over 40X-675.

For more data circle **25** on Reader Service Card

METABOND

MEANS *PROGRESS* IN RUSTPROOFING

METABOND is the only effective immersion or spray amorphous type zinc coating in the industry today.

METABOND withstands severe and consistent flexing and bending without chipping or breaking bond.

INTERNATIONAL RUSTPROOF CORPORATION

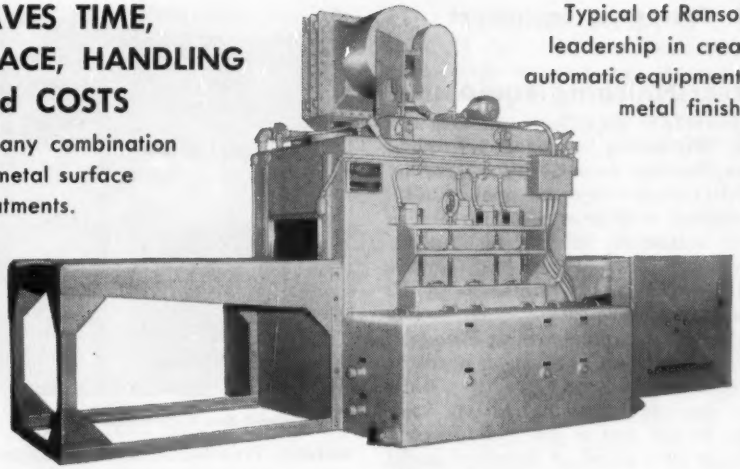
12507 PLOVER AVENUE • • • • CLEVELAND 7, OHIO

MANUFACTURERS OF RUST PREVENTIVES AND CORROSIVE SOLVENTS

SAVES TIME, SPACE, HANDLING and COSTS

on any combination of metal surface treatments.

Typical of Ransohoff leadership in creating automatic equipment for metal finishing.



New "Walking Spray" Cabinet Type

RANSOMATIC

offers a big opportunity for economy if you now use still tanks

Just roll a batch of work into the cabinet of a Ransomatic, press a button, and the work will be treated with any pre-determined sequence of solutions and rinses—thoroughly, accurately and efficiently. Can be built for any size work or any number or combination of solutions. Also built in drum type for work that can withstand rolling. Send for complete details.

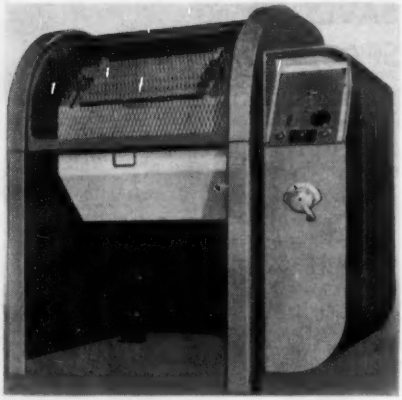
Representatives In Principal Cities

RANSOHOFF, Inc.

610 North Fifth Street **Hamilton, Ohio**

Barrel Finishing Equipment

Available in six different models and sizes, "Futurama" series barrel finishing equipment, recently announced by Speed-D-Burr Corp., Glendale, Calif., is designed to offer a model for almost every industrial barrel finishing requirement. The "Futurama" deluxe model comes in two sizes, 36 by 32 inches or 24 by 24 inches — either one or two compartment style. Designed for handling high production needs or processing large work loads, these units come equipped with a 1½ h.p. varispeed motor and a low voltage electronic control panel. A standard model 36 by 32 inches or 24 by 24 inches—1 or 2 compartment—is also available as is the economy model in the same sizes. The line includes a "Hot Sawdust Barrel" used for drying, polishing, and waxing. This model also comes in the deluxe, standard and economy models.



Speed-D-Burr Barrel Finishing Machine

Among the features found in the "Futurama" series is the "swing-away" safety hood which is designed to protect the operator. It is pivoted so that it may be manipulated easily. An electronic control panel gives the operator control over the barrel at all times and helps assure greater safety.

For more data circle **26** on Reader Service Card

★ ★ ★

Emulsion Finish

An industrial emulsion paint called Uni-Mulsion has been announced by Universal Paint & Varnish, Inc., Northfield and Krick Rds., Bedford, Ohio. Several colors and types are available.

The line includes clears with a brilliant gloss or a low sheen; primers formulated to give good adhesion to ferrous and non-ferrous metals; and enamels in a wide range of colors and in high or low gloss.

Adhesion of Uni-Mulsion on aluminum is reported to be particularly noteworthy. Films are in general very flexible, and are said to have good moisture resistance. Other advantages claimed for these paints are that fire hazard and odor in the water based system are absent; fast air dry and baking cycles

Protect spray booths with
BOOTHCOTE
the finest product made!

SAFER
Non-Inflammable, Non-Toxic
DRY-OR-WET
Boothcote No. 4 for dry wall booths (just peel off overspray)
Boothcote No. 5 for water wash walls

SAVES
TIME, LABOR, MONEY!
(Apply — Spray or Brush)
In 55 gal. drums . . . 80¢ gal.
In 15 gal. drums . . . $1.00 gal.
In 5 gal. pails . . . $1.25 gal.
F.O.B. Buffalo, N. Y.
Inquiries Invited — Samples on Request

HYGRADE
Food Products Corp., Industrial Division
18 Stetson St., Buffalo 6, N. Y.

are possible; reduction with water is feasible; and wet parts may be dipped in Uni-Mulsion.

These coatings may be applied by spray, electrostatic spray or dip.

For more data circle **27** on Reader Service Card

★ ★ ★

Vacuum Metallizing Apparatus

Consolidated Vacuum Corporation, Rochester, N. Y., has announced a 48-inch vacuum metallizing unit. This unit is designed for vacuum coating on a production scale. The horizontal chamber and its rotating fixture assembly have a large load capacity, and the high speed pumping system minimizes the time necessary to perform a complete coating cycle.

For more data circle **28** on Reader Service Card

Cleaner-Stripper

Du-Al No. 489, an alkaline compound that removes rust, scale, paint, grease and oil in one operation has been announced by Chemclean Products Corp., 610 Warren St., Brooklyn, N. Y.

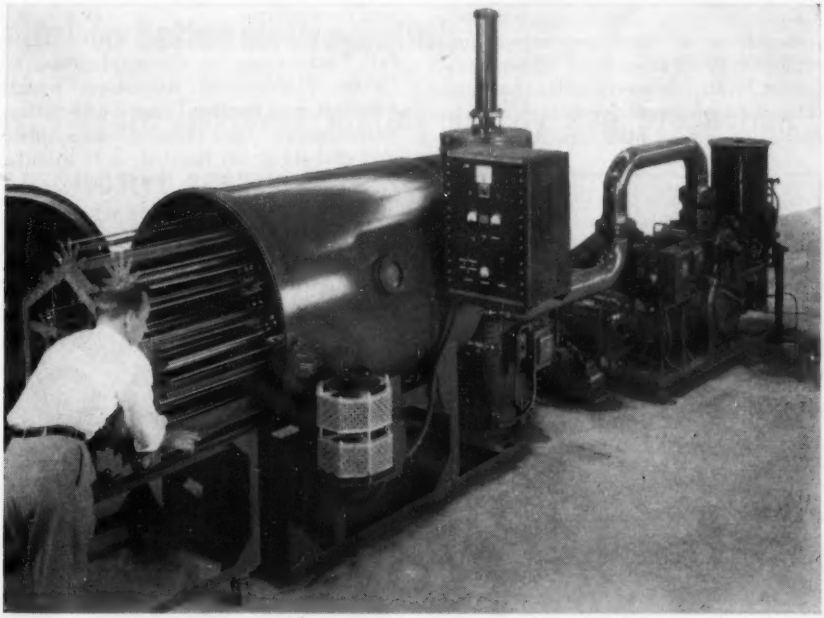
The manufacturer reports that the material is non-corrosive to ferrous metals. It can be used as a soak, or electrolytically with reverse or direct current.

For more data circle **29** on Reader Service Card

★ ★ ★

Light-Duty Roller Coater

A roller coater, designed especially for light-duty production or for laboratory or experimental work, has been announced by the Union Tool Corporation, Warsaw, Indiana. Identified as Model No. 5, this line of light-duty roller coaters is adaptable for applica-



Vacuum Metallizing Unit

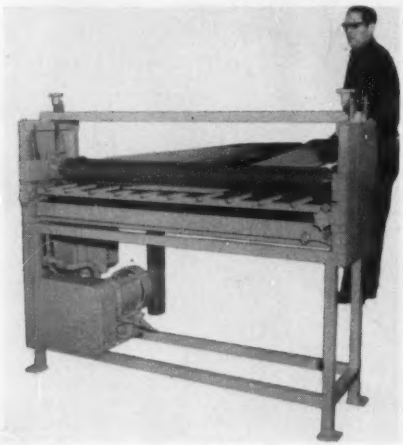
tion of any type of viscous compound to either or both sides of any metal or other flat material in thicknesses up to four inches. The model lends itself readily to a wide range of adaptations to fit any coating requirement.

Four production types are offered: 5-A and 5-B are double coaters, each having two coating and two doctor rolls; 5-C top single coater and 5-D bottom single coater are equipped with one coating roll, one doctor roll and one backup roll.

Rolls are available in standard lengths of 14, 25, 38 and 50 inches. Screw-type feed adjustment is positive and accurate, assuring precise control of thickness of application. Standard models are built to run at 75 l.f.m.; other speeds available as desired.

Optional equipment includes variable speed drive, circulating pumping unit, explosion proof electricals, water-cooled doctor rolls, heated rolls, hardened rolls, deburring rolls, casters, conveyors and hopper feed attachments. All Union models except Model 5 are equipped with standard safety device with reversing switch.

For more data circle **30** on Reader Service Card



Light Duty Roller Coater

★ ★ ★

Rubberized Abrasives Kit

Cratex Manufacturing Company has developed a comprehensive Polishing Kit to handle deburring, smoothing and polishing applications. The kit contains an assortment of 24 of the most popular Cratex Polishing Wheels, Cones, Blocks and Mandrels designed for cleaning and polishing molds, dies and castings, removing film, coatings and enamel, blending in and polishing welded seams after rough grinding, polishing bearing surfaces and raceways, cleaning and polishing commutators and contact points, and removing rust, heat marks, tarnish, excess solder, scratches and corrosion.

Each Cratex Polishing Kit contains full instructions on the application of Cratex Rubberized Abrasives, which are designed to give "cushioned action performance" in burring, smoothing and polishing on hard or soft metals.

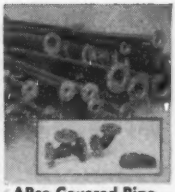
For more data circle **31** on Reader Service Card

Rubberized Abrasives Kit and assortment contained therein.

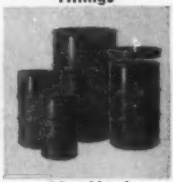
• To electroplaters and plating department heads in every section of the nation, the name ARco is symbolic of broad engineering knowledge . . . advanced methods and equipment . . . bringing top plating results.

Corrosion-resistant ARco rubber coverings are applied to tanks and accessories, Diaphragm Systems, Parts Separators, Air Agitation Systems, Grids and Screens, Ventilation Equipment, Pipes and Fittings, Materials Handling Equipment. For expert advice on economical, efficient rubber applications to electroplating equipment, call on ARco Engineers. Their help is offered to you without obligation.

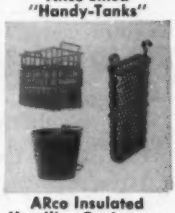
ARco Lined Open Tank


ARco Covered Pipe, Fittings

ARco Lined Diaphragm Tank


ARco Lined "Handy-Tanks"

ARco Lined Tumbler


ARco Insulated Handling Equipment

ARco Materials, Equipment, Engineering and Service . . . Vital To Better Electroplating

. . .assure improved plating quality and production!

AUTOMOTIVE RUBBER CO., INC.
12564 BEECH ROAD • DETROIT 39, MICH.
Manufacturers • Designers • Engineers

ARco RUBBER PROCESSORS
4033 Homestead Road
Houston • Texas

ARco
FIELD SERVICE UNITS
ARco Field Service Engineers bring their "know-how" and equipment right into your plant. Permanently installed or large equipment can be fabricated and covered on the job by Field Service Units. (Licensed Saran Applicators).

AUTOMOTIVE RUBBER CO., INC.
12564 Beech Rd., Detroit 39, Mich.
Please rush me _____ copies of your "Diaphragm Tanks Promote Plating Progress."
Name_____
Firm_____
Street_____
City_____ State_____

NEWS of the Industry

NEW PLANTS

An open house has been held celebrating the establishment of the new Laboratory and Research Building of the **METALS DISINTEGRATING COMPANY**, located at Lehigh Avenue Union (suburb of Elizabeth), N. J.

The building represents one of the most complete structures of its kind in the field of finely divided metals, of which this company is a large manufacturer. One of the features of the building is its wide range of particle size analysis facilities. Here, constant research and production tests determine particle size to the finest degree.

Facilities in the new plant include equipment for particle size analysis, physical testing, pulverizing, air conveying and dust collecting, and metal chipping.

Included in the display of this division was the Mikro Chipper, for work such as with magnesium, and a special pulverizer-air conveying-dust collecting unit demonstration, showing the equipment produced by this phase of the company's activities in that field.

The display of Metal Powders included a special demonstration of Filter Powders, the unique properties and uses of which were described.

The work of the company in the field of application of metal powders to the strengthening of epoxy resin molds or castings was shown in detail.

Among the many new developments of the company on display and demonstrated, were its work and products for the graphic arts field, including aluminum and gold bronze powders for letterpress, offset, and gravure use, as well as in such applications as wallpaper, textiles, and plastics.

★ ★ ★

METAL & THERMIT CORP. has announced that a new general office building will be constructed at Woodbridge, N. J., adjacent to the company's Woodbridge Research Laboratory. The firm, which produces metals, industrial chemicals, welding equipment and supplies, will continue to occupy offices at 100 E. 42nd St., New York, N. Y.

The new building at Woodbridge, which is expected to be ready for occupancy by April, 1956, will house the operating departments of Metal & Thermit Corp. and its subsidiary and affiliated companies in the New York metropolitan area, including sales headquarters for the northeastern region.

★ ★ ★

STANLEY CHEMICAL COMPANY of East Berlin, Connecticut has added a large, new conference room adjacent to the laboratory where all Stanley finishes and vinyl compounds are formulated.

★ ★ ★

NORTHWEST CHEMICAL COMPANY, 9310 Roselawn, Detroit 4, Michigan, nationally prominent manufacturer of chemical cleaners, has completed an addition to present facilities, according to an announcement by H. J. McCracken, president.

COMPANIES

The **LEA MANUFACTURING CO.**, Waterbury, Conn., manufacturer of Lea Compositions for surface finishing and developer of satin finishing and other techniques, has announced the formation of an English affiliate, Lea Manufacturing Company of England, Limited, with offices and factory in Buxton, England. Although there are British interests, the English company is controlled by The Lea Manufacturing Company of Canada, Limited, another affiliate of Lea of Waterbury.

★ ★ ★

William Stoll, president of **ALLIED PORCENELL, INC.**, Waukegan, Ill., sales representatives for Porcenell inorganic silicate coatings, has announced the appointment of the **HEINTZ MANUFACTURING COMPANY**, Philadelphia, as eastern manufacturing licensee for these low-fire protective coatings and sealers.

The Heintz Company will produce and assist in the sale of Porcenell through the Porcelain Enamel Division.

A development of Vitreco, Inc., Waukegan, Ill., Porcenell is distributed and sold by Allied Porcenell, Inc., of Waukegan, Ill., and Phoenix, Arizona. Its development was sponsored jointly by Youngstown Sheet and Tube Co., Youngstown, Ohio, and Poor & Company, Chicago. It is currently being used as a protective decorative coating for such applications as refrigeration components, structural panels and corrugated building materials, chalk boards, marine horns and lighting fixtures; high voltage electrical components, furniture and fixtures, and air conditioning components.

To aid in the distribution, Allied Porcenell has appointed **WALTER A. GORREL, HENRY ATWATER** and **D. S. HOFFMAN** as eastern representatives.

★ ★ ★

Paint spray booths, baking ovens and flow coating machines have been added to the line of cleaning and phosphatizing machines and conveyors designed and manufactured by the **INDUSTRIAL WASHING MACHINE CORP.**, Matawan, N. J., it has been announced by Howard N. Sadwith, president of the company. The addition of this equipment will now enable Industrial to supply complete installations for product finishing, from the initial preparation to the completed paint job.

The booths, ovens and flow coating machines are made in all sizes for any capacity of work, from small component parts to completed automobiles or other large items. They can be constructed according to the design and specifications of the customer, or will be completely engineered by Industrial's technicians. Heating may be by steam, gas, electricity or oil. Consultation with Industrial engioneers to solve problems is encouraged.

Representatives of Heintz Manufacturing Company, Philadelphia, and Allied Porcenell, Inc., Waukegan, Ill., met in Waukegan, Ill., to discuss plans for production and sales of the silicate protective coating. Standing, left to right: Messrs. Hoffman, Stark, Gunn and Kahler; Seated, clockwise: Messrs. Boehler, Chester, Gorrell, Stella, Olbur, Heins, Mooney, Stoll, Green, Bins, Schuster, Leutwyler, Atwater, Hannan, McLaughlin and Irwin.

The name of **UNITED CHROMIUM, INC.**, has been changed to the **UNITED CHROMIUM DIVISION, METAL AND THERMIT CORPORATION.** The close relationship between Metal & Thermit Corporation and United Chromium, Inc., has existed since 1925, the latter company becoming a wholly owned subsidiary of the former in 1945. Since then, the diversity of activities of these companies, both engaged in the metals and chemicals fields, has made it desirable to bring about closer coordination between them.

The same personnel that has conducted the activities of United Chromium in the past continues at work in the combined organizations, and as the United Chromium Division of Metal & Thermit Corporation, the United Chromium products, processes and services will be available on the same basis as heretofore.

★ ★ ★

Visitors and attendants in the booth of Cowles Chemical Company took time out for a look at the camera during the recent A.E.S. Industrial Finishing Exposition in Cleveland.
At extreme left, George R. Woleben, Cowles technical representative from Brocton, N. Y., demonstrates the adhesive properties of Cowles Ty-Bond, zinc phosphate metal coating, to four visitors from Pittsburgh Plate Glass Company, Kokomo, Ind.
Standing sixth, seventh and eighth from left are Earl F. Clark, manager, Elmer A. Lord and Carl C. Clabaugh, sales manager of the Cowles Metal Cleaner Department.

★ ★ ★

The biggest low-voltage d.c. generating system in history has been put into operation at the new **CHEVROLET SPRING AND BUMPER PLATING PLANT,** Livonia, Michigan. The plant, which is reported to be the world's largest, is equipped with a total of 48 custom-built **CHANDEYSSON** motor-generator sets. They provide a total d.c. output of more than 625,000 amperes for round-the-clock operation.

The motor-generators range in size from 7,500 ampere units at nine volts, to 20,000 ampere units at 12 volts. An idea of the size of the installation may be gained from the fact that over half a million pounds of copper bus bar were required to connect the generators with their plating tanks.

The plating system consists of three straight line, fully automatic plating machines, each 535 feet long. Operating at full capacity, they plate a bumper every three seconds.

NEW POSITIONS

John F. Esping

JOHN F. ESPING has joined the staff of Wyandotte Chemicals Industrial, Railroad and Aircraft Department. He will have headquarters in the Kansas City district.

Mr. Esping received training at the Wyandotte Chemicals Industrial Research Laboratories, as well as in several nationally known metal working plants and plating shops before joining Wyandotte's Kansas City staff.

★ ★ ★

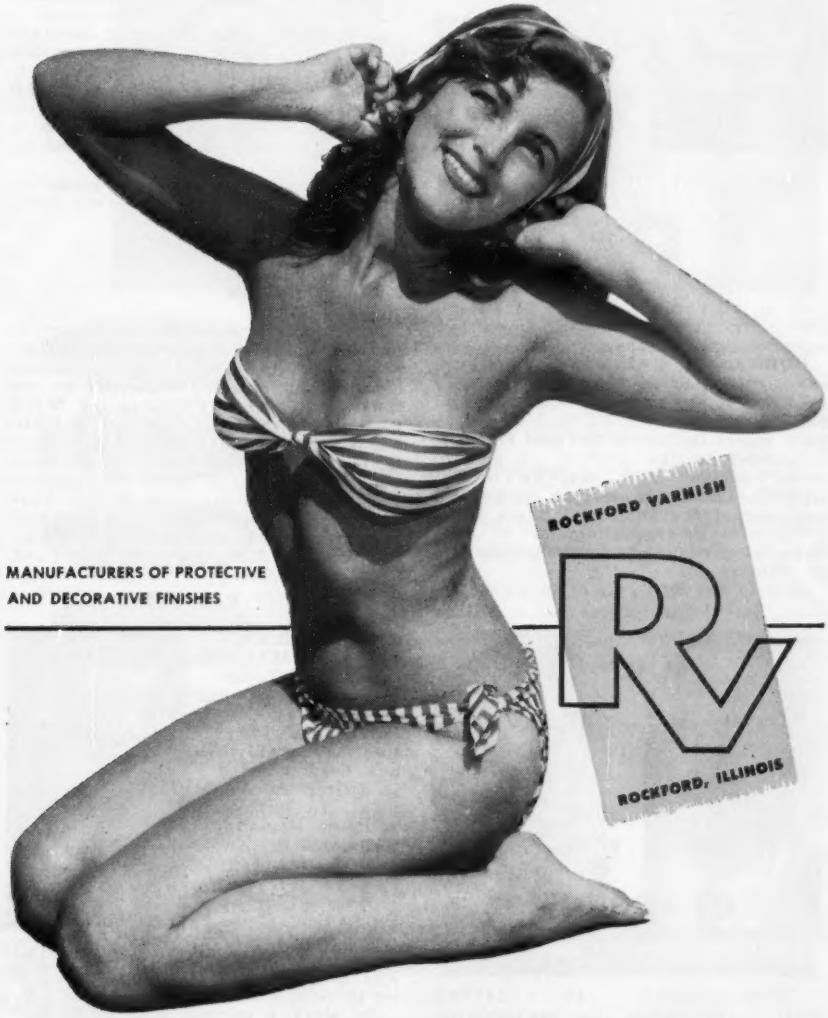
JOSEPH D. ROBERTSON, of Decatur, Ga., has been appointed sales engineer for the W. W. Sly Manufacturing Co. of Cleveland, Ohio. The announcement was made by David E. Neustadt, sales manager of the Sly Company.

Mr. Robertson's previous associations have been in sales engineering for the A. O. Smith Corp., and the F. J. Stokes Machine Co., Philadelphia, Pennsylvania.

He maintains offices in the Rut'and Building, Decatur and will cover Georgia, South Carolina and North Carolina.

The Sly Manufacturing Company manufactures cloth type filters, industrial ovens, tumbling mills and air-blast equipment.

● Things are looking up when you take from R/V — varnishes, enamels, and lacquers of all kinds — and a group of special finishes to suit your needs. Let us hear from you . . .



MANUFACTURERS OF PROTECTIVE AND DECORATIVE FINISHES

Affiliate: GORDON BARTELS CO., *Roller Coating Specialists*

Robert J. Potter

ROBERT J. POTTER has been named secretary-treasurer and general manager of Potter Paint Co. of Indiana, Inc., Cambridge City, Indiana.

Mr. Potter has been associated with Potter Paint Co., Inc., Cortland, N. Y., as vice president for several years and now brings his manufacturing and administrative experience to the new company in Cambridge City, Ind.

★ ★ ★

R. M. Richards, president of Peters-Dalton, Inc., Detroit, has announced two major executive appointments.

ROBERT G. CALLISON, formerly sales manager, has been elected vice president in charge of regional sales and sales promotion. Mr. Callison has been with Peters-Dalton for the past 18 years. Appointed to the position of general sales manager is **T. KENNETH McGUIRE.** Previously serving as general manager of the Industrial Sheet Metal Division of Peters-Dalton, Mr. McGuire has a background of 20 years in this field of industry.

Now in the 26th year of corporate activity, Peters-Dalton, Inc., has established itself as a leader in the field of industry as manufacturers of paint spray booths, drying and baking ovens, industrial washing equipment, dust collecting systems and re-usable metal containers.

Robert G. Callison

T. Kenneth McGuire

★ ★ ★

W. E. Noyes, vice president in charge of sales of The Diversey Corporation, has elevated three men to new posts.

J. A. McMURTRY, formerly assistant general sales manager, has been named divison manager to head a newly created East Central Division. **C. R. REID** has been promoted to sales manager, food industries and **H. M. PICKLES** to assistant to the sales manager, food industries.

The Diversey Corporation manufactures processing chemicals for the metal working field.

MEETINGS

JOHN S. CONGLETON, president of the New York Paint and Varnish Production Club, has been named the general chairman of the Host Committee for the **33RD ANNUAL MEETING OF THE FEDERATION OF PAINT AND VARNISH PRODUCTION CLUBS,** to be held in New York City on October 3, 4, and 5.

Mr. Congleton, of Maas & Waldstein Co., will head a group of 28 New York Club members who have been delegated to serve on five sub-committees: Floor, Registration, Entertainment, Banquet, and Dance.

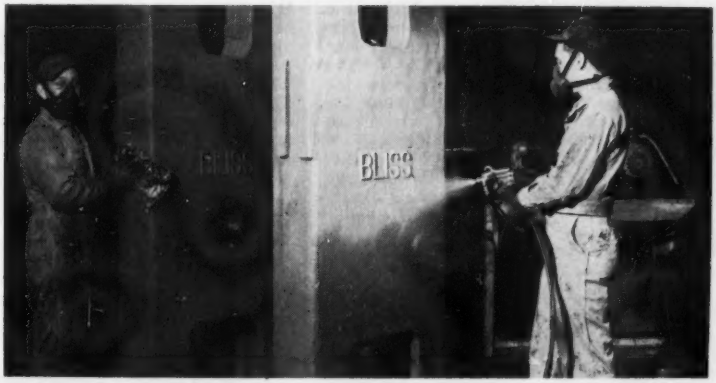
★ ★ ★

DR. HERMAN FRANCIS MARK, director of the Polymer Research Institute at the Polytechnic Institute of Brooklyn, has been selected to deliver the Annual Joseph J. Mattiello Memorial Lecture at the Annual Meeting of the Federation of Paint and Varnish Production Clubs, which will be held October 3, 4, and 5 at the Hotel Statler in New York.

Dr. Herman F. Mark

Dr. Mark, a polymer scientist of well-recognized achievement, has announced

HOW TO TAME A "GIANT PAINTING JOB..."



CUT PAINT LOSSES

INCREASE PER GALLON COVERAGE

SAVE ON SOLVENTS

REDUCE HEALTH HAZARDS

MAINTAIN UNIFORM VISCOSITY

DESIGNED TO FIT YOUR NEEDS

E. W. Bliss Company, manufacturers of mechanical and hydraulic presses, Canton, Ohio, know how to do a tough job the easy way.

These men are spray painting giant size machinery right on the spot . . . where it suits them best.

What's most important is that they are not using conventional air spray guns. They are using the new Bede Airless Atomization method of spray painting . . . which utilizes pressure and heat rather than air to atomize paints and solvents.

Airless spray painting is the newest thing in the paint and protective coating industry today. It's important to you because you'll save on material costs and labor. Investigate its possibilities for your uses today.

See Airless Spray Painting on demonstration at the National Metal Exposition, Booth 1361, October 17-21, Philadelphia.

WRITE FOR CATALOG ON REVOLUTIONARY NEW AIRLESS SPRAY PAINTING PROCESS . . . *IT'S NEW*

BEDE PRODUCTS CORPORATION

HOT SPRAY AND AIRLESS INDUSTRIAL FINISHING EQUIPMENT

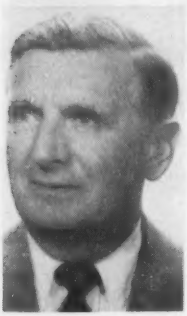
JACKSON ST. AMHERST 44-711 AMHERST, OHIO

In Canada: Bede Products Canada Ltd., 864 Pape Street, Toronto

that the title of his paper will be "New Types of High Polymers and Their Application in Paints and Varnishes."

The Mattiello Lecture, instituted by the Federation, commemorates the name of Joseph J. Mattiello who, as a member of the Federation, did so much to expand the application of science in the protective coatings field. The committee which made the selection this year included: A. E. Stauderman, chairman (Louisville Club); P. O. Blackmore (New York Club); W. J. Greco (New York Club); and H. H. Zimmerman (Chicago Club).

HONORS



John J. Forbath

At the 37th Annual Banquet of the Masters' Electro-Plating Association, **JOHN J. FORBATH,** owner of Star Chromium Corp., received the "Plating Man of the Year Award." On behalf of the Association, Frank Kaiser presented Mr. Forbath with a bronze plaque inscribed as follows: "To honor John J. Forbath for his devoted services and untiring efforts to promote good will and sound business practice towards the advancement of M.E.P.A. and the Metal Finishing Industry. Presented with esteem and affection by the Masters' Electro-Plating Association, 1955."

I. B. Thomas, DeVilbiss School of Spray Painting instructor gives information on spray painting to Susan Walters, DeVilbiss office employee who asked for information to aid her in sales correspondence.

RAY D. ANDREWS, a supervisor at General Electric's Schenectady Plant, submitted the Winning Entry in **WAGNER BROTHERS' "NAME THE AUTOMATIC" CONTEST,** it has been announced at the Final Banquet concluding the 1955 Industrial Finishing Exposition. Out of 700 entries, Mr. Andrew's "Platocrat" won the complete assortment of high fide'ity audio equipment, including turntable with pick-up, amplifier with remote control, speaker cabinet and tape recorder.

★ ★ ★

Receipt for 1954 of the National Safety Council's Award of Honor, its highest, has been announced at Troy, N. Y., by the **BEHR-MANNING DIVISION OF NORTON COMPANY.**

To earn it, nearly 2,000 employees worked almost 4,000,000 man-hours with only 12 lost-time or disabling injuries. Behr-Manning attained a frequency of injury 69 per cent better, and a severity rate 90 per cent better, than the average for its industry.

The achievement was commemorated with a series of employee safety meetings which emphasized the extension of safety consciousness to the home, and were featured by a special film in which President E'mer G. Schacht congratulated the employees.

TRAINING COURSES

There's always something new and different in the spray painting classes at the **DEVILBISS COMPANY,** Toledo, Ohio, manufactures of spray painting equipment. The DeVilbiss spray painting school curricula is ever changing to incorporate the latest information about materials and equipment. In many cases, students in the classes are given va!uable previews. Currently, I. B. Thomas,

instructor, has devoted a part of the curriculum to the catalyst spray gun. Class work is composed of both theory and actual practice in the DeVilbiss laboratories.

The spray painting course begins in the classroom where the spray gun is explained. The theory sessions extend to the other equipment which a spray operator will use. Every item constituting a complete spray painting outfit is thoroughly covered. Air pressures, material viscosities, film thicknesses and all of the ramifications of painting are discussed. The pupils are also taught to assemble and disassemble equipment.

After the classroom work, the group is taken into the laboratory where everyone is given an opportunity to prepare materials and spray them. Each student is taught the use of the gun. The classroom theory is put into actual practice so that students can see for themselves the results which correct techniques produce.

Enrollment in the school is free, the only cost to the student being his board and room. Enrollment applications may be obtained from the DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio.

Dates for beginning courses of instruction in industrial spray finishing for the remainder of 1955 at the DeVilbiss Company School of Spray Finishing in Toledo are as follows: August 15, September 12, October 3, November 7, and December 5.

★ ★ ★

An agreement recently signed between the Institute Electroquimico, S. A., Barcelona, and the **JOSEPH B. KUSHNER ELECTROPLATING SCHOOL**, 115 Broad St., Stroudsburg, Pa., will make available to the Spanish electroplating industry a Spanish version of "Electroplating Know How," the home study course in modern electroplating. A translation of the course is now in preparation and will be available in the next few months. The Spanish course will be given by the Institute Electroquimico under the personal supervision of Prof. M. Terol, well known Spanish electrochemist and metallurgist. The Spanish students will

FOR SALE
USED
PLATING EQUIPMENT

3 Hanson-Van Winkle-Munning Automatic Plating Machines
1 Udylite Automatic Plating Machine
3 6,000 Gallon rubber lined storage tanks 10′ x 8′ x 10′
1 Rubber lined tank 8′ x 3′ x 5′
3 Industrial Filter Pumps—8,000 gallon capacity
2 Titeflex Filters
2 Alsop Hi-Speed Filters
1 Phillips Degreaser
1 Blakeslee-Niagara Washing Machine
1 Blakeslee Drying Unit
1 Kreider—New Holland Centrifugal Dryer
2 Falls Industry Impervite Heat Exchangers, 7 tube standard, 9′ long
Barrel Plating Equipment
Hartzel, Sturtevant and Garden City Electrical Fans

Write—Wire—Phone

W. G. Smith, Stamping Division
EATON MANUFACTURING COMPANY
755 East 140th Street, Cleveland 10, Ohio
Telephone: GLenville 1-5600

be awarded diplomas on completing the course and their scholastic records will be kept both in Spain and the United States.

★ ★ ★

A 5-day **SHORT COURSE ON CORROSION** sponsored jointly by **WASHINGTON UNIVERSITY**, St. Louis and the Greater St. Louis Section, **NATIONAL ASSOCIATION OF CORROSION ENGINEERS**, will be held September 12-16, inclusive. The course will include sessions on corrosion theory, metallurgical and mechanical factors, types of corrosion, designing to prevent corrosion, treatment of environments, selection of materials, cathodic protection and protective coatings.

★ ★ ★

The **FALL TERM IN ELECTROPLATING** at the **BROOKLYN EVENING TECHNICAL HIGH SCHOOL**, 29 Fort Greene Place, Brooklyn, N. Y., begins September 14, 1955. The course will include methods of analyzing plating solutions. Laboratory experiments include analyses of copper, nickel, chromium, silver baths; hardness tests, chemical tests for thickness; and Hull Cell study and anodizing. Classroom discussion covers such topics as tank area calculation, a review of chemistry, wetting agents, pH, brighteners, pitting, buffer agents, throwing power, specific gravity, Baume readings, dummying, deionizing, filtration, and reading graphs.

Registration will be held September 12, 1955 and daily thereafter from 7:00 to 9:00 P.M. Classes will be held on Monday and Wednesday from 6:45 to 8:15 P.M. plus about six Friday nights during the term. The term begins September 14, 1955 and ends January 31, 1956. See Mr. Serota, room BW17 or 3E10.

SOCIETIES

Announcement has been made of the merger of the National Association of Metal Finishers and the National Federation of Metal Finishers. The consolidated group, which will be known as the **NATIONAL ASSOCIATION OF METAL FINISHERS**, was organized for the purpose of obtaining unified representation of the metal finishing industry in both local and national matters. Organized with the individual as well as industry problems in mind, the new **N.A.M.F.** will provide valuable services at industry levels. Provision has been made for local and regional groups to continue to operate independently so as to cope with problems which cannot be translated to the national level.

The membership structure of the new national association has been organized with three classes of members: Local associations of plating firms, individual plating firms not affiliated with a local group, and "captive" shops.

★ ★ ★

THE SOUTHERN PAINT AND VARNISH PRODUCTION CLUB has announced the establishment of six scholarships at the University of Florida in Gainesville. The university is going to institute a course in Paint Technology this coming fall under the direction of Dr. W. H. Beisler, Head Professor of the College of Chemical Engineering, and the Southern Club has already awarded the $500 scholarships to deserving young men who were selected by the University's Scholarship Committee.

meetings OF INTEREST TO FINISHERS

Sept. 14-16. Annual Shop Practice Forum, Porcelain Enamel Institute, Ohio State University, Columbus, Ohio.

Oct. 3-5. 33rd Annual Meeting, Federation of Paint and Varnish Production Clubs, Hotel Statler, New York, N. Y.

Oct. 9-13. Fall Meeting, The Electrochemical Society, William Penn Hotel, Pittsburgh, Pa.

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For further data on products mentioned in this issue, use READER SERVICE CARD inside back cover.

Opportunity Section

LOOKING FOR A
BETTER OPPORTUNITY?

As one of the nation's larger manufacturers of industrial cleaning and processing compounds and equipment distributors, we have by far the most complete line of materials for major industry, including ultrasonic equipment and cleaning compounds.

Our technological advance in products and related processes has been so rapid we must expand our sales force, particularly in the Midwest and Eastern manufacturing areas. Industrial Paint Salesmen, Chemical Engineers or men experienced in chemical processing in metal fabrication, plants, will qualify.

Compensation: Base salary, plus commissions based on sales; car allowance or car furnished, reimbursement of expenses; Profit Sharing Plan, a better than average opportunity.

If you qualify, please furnish a complete resume of employment history, age, etc. All replies confidential. Our employees are aware of this ad. Write Box 84, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

SOUTH FLORIDA TEST SERVICE

Testing—Inspection—Research—Engineers

Consultants and specialists in corrosion, weathering and sunlight testing.

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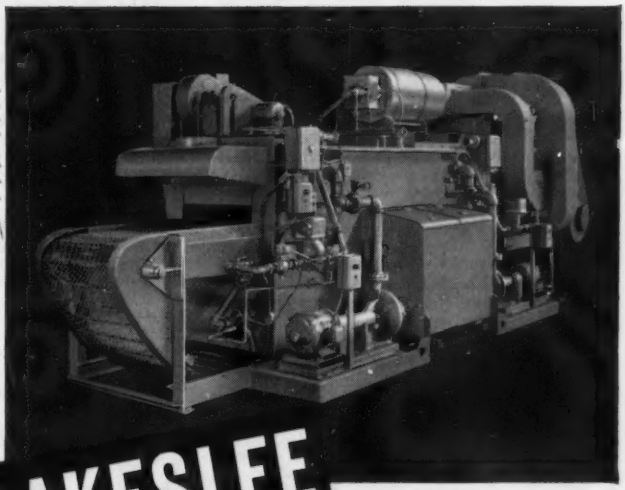

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PRODUCT LITERATURE

57. Clear Plastic Coating
Champion Bronze Powder & Paint Co., Inc., 2101-2121 N. Elston Ave., Chicago, Ill., has available literature describing clear plastic coatings for protecting finished and unfinished products with a high gloss, corrosion resistant finish.

58. Acid-Alkali-Proof Construction
Data on engineering and construction facilities for chemical proof construction is available from the Chemsteel Construction Co., Inc., 301 Chemsteel Bldg., Walnut St., Pittsburgh 32, Pa.

59. Teflon
Bulletin No. 410, listing available shapes and properties of DuPont's Teflon, has been issued by Micromold Products Corp., 11 Centre Place, Yonkers, N. Y. Outstanding properties and applications of this resin are noted. Teflon is available in a variety of forms, including tape, moldings, rod, sheet, cylinders, and as a coating.

60. Non-Destructive Thickness Tester
A thickness tester designed to be used in the inspection of metallic coatings on almost any base is described in a bulletin available from Unit Process Assemblies, Inc., 75 E. 4th St., New York 3, N. Y.

61. Compact Automatic Plating Machine
A description of the "Little Steve" Automatic Plating Machine, designed for efficient processing of relatively small and medium sized parts is contained in a bulletin available from Frederic B. Stevens, Inc., Detroit 16, Mich.

62. Heavy Duty Metal Cleaner
Facts on Cowles HD-N Cleaner, which is formulated for heavy duty cleaning, are given in a booklet being distributed by the Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3, Ohio.

63. Copper Plating Anodes
"Effect of Anode Composition in Acid Copper Plating" is the title of a paper presented by R. P. Nevers, R. L. Hungerford, and E. W. Palmer, reprints of which may be obtained from the American Brass Co., Waterbury 20, Conn.

64. Germanium Rectifier Power Supply
A technical description of germanium rectifier d.c. power supplies is contained in a bulletin which may be obtained from Section 463-12E, General Electric Co., Schenectady 5, N. Y.

65. Unit Sisal Buffs
Advantages found in the use of unit sisal buffs are explained in a folder which may be obtained from the American Buff Co., 2414 S. LaSalle St., Chicago 16, Ill.

66. Solution Filters
Operation of filters designed for electroplating and plating waste treatment is explained in a folder which may be obtained from Wagner Bros., Inc., 432 Midland, Detroit 3, Mich.

67. Electropolishing Concentrate
Ferro-Glo 500, which is used to polish low and medium carbon steels, is the subject of a bulletin being distributed by the Electro-Glo Co.,1430 S. Talman Ave., Chicago 8, Ill.

68. Finishing Ovens
Gas fired finishing ovens designed for specific production requirements are described in a bulletin which is available from The Lanly Co., 770 Prospect Ave., Cleveland, Ohio.

69. Plating Barrel
Advantageous features of the Lazo Lucite Plating Barrel are pointed out in a bulletin which may be obtained from the Hardwood Line Mfg. Co., 2022 N. California Ave., Chicago 47, Ill.

70. Felt Polishing Products
A catalog available from the Bacon Felt Co., 447 W. Water Street, Taunton, Mass., lists and gives recommended uses and specifications for a variety of felt polishing products.

71. Bright Gold Plating
"Bright Gold Plating" is the title of a paper given by Edwin C. Rinker, a copy of which may be obtained from Sel-Rex Precious Metals, Belleville 9, N. J.

72. Centrifugal Dryer
Operational details are emphasized in a bulletin concerning the Model 20 Kreider Centrifugal Dryer, available from the New Holland Machine Co., New Holland, Pennsylvania.

USE CARD FOR FREE LITERATURE

73. Prefabricated Plating Racks

Drawings are used to illustrate the variety of "Erect-A-Rack" parts available for constructing plating racks from prefabricated parts, in a bulletin being distributed by the Standard Plating Rack Co., 1913-25 N. Paulina St., Chicago, Ill.

74. Chemical Resistant Coatings

Several tables give information on resistances of Ucilon Systems to many chemicals, directions for use of each, and recommendations on what material to use on specific surfaces, and for various applications, in a catalog available from United Chromium Div., Metal & Thermit Corp., 100 E. 42nd St., New York, N. Y.

75. Conveyor Catalog

A catalog describing advantages, applications and specifications of Tipp overhead "Cable-Way" trolley conveyors may be obtained from Tipp Manufacturing Co., Tipp City 9, Ohio.

76. Enameling Iron

A booklet available from Armco Steel Corporation, Middletown, Ohio, deals with the subject of porcelain enamel and enameling iron. It describes and illustrates advantages of porcelain. A section on enameling iron covers such points as uniformity, surface, mechanical properties, and gauges and sizes. There are other sections on design for porcelain enamel parts, fabrication, cleaning and pickling, good enameling practice, testing, and safe crating .

77. Maintenance Coatings

A folder on industrial maintenance available from Thompson and Co., 1010 Allegheny Ave., Oakmont, Pa., describes 25 types of maintenance paints and coatings. It is divided into sections according to job, so that the reader can quickly find type of paint recommended by the manufacturer for a specific purpose.

78. Air Compressor Handbook

A handbook on compressed air installations may be obtained from Sarco Co., Inc., Dept. P, Empire State Bldg., New York 1, N. Y. Entitled "Is Your Air Compressor Capacity Effective?" the book contains sketches designed to help users of compressed air improve capacity.

79. Industrial Washing Machine

Descriptive data and specifications for the International Automatic Indexing, Fixture Type Three Stage Precision Industrial Washing Machine are given in a bulletin which may be obtained from the International Conveyor and Washer Corp., 652 E. Fort St., Detroit 26, Mich.

80. Protecting Painted Surfaces

A bulletin on strippable plastic coating for the temporary protection of lacquered, painted and enameled surfaces is available from Spraylat Corporation, 1 Park Ave., New York 16, N. Y.

81. Tin Alloy Plating Processes

Three plating processes, for depositing tin-nickel, tin-zinc, and copper-tin alloys are described in a folder which may be obtained from the Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y.

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82. Centrifugal Pumps

Bulletin No. 854 covers six standard models of Impervite impervious graphite centrifugal pumps ranging in size from 25 to 2,000 g.p.m. at 20 to 100 feet.

Also included are detailed parts drawings, accurate dimensional drawings, and performance charts for each model. Chemical and physical properties of Impervite impervious graphite are also listed. Falls Industries, Inc., 31767 Aurora Road, Solon, Ohio.

83. Rectifiers

Outstanding features of Ther Selenium Rectifiers are described in a booklet which may be obtained from the Ther Electric and Machine Wks., 17 S. Jefferson St., Chicago 6, Ill. Several models, designed specifically for plating or anodizing, are described in detail.

84. Corrosion-Proof Materials

Catalog G-201, available from The Ceilcote Co., 4848 Ridge Rd., Cleveland 9, Ohio, gives information on a broad range of corrosion proofing materials, services.

85. Zinc for Corrosion Control

"How Zinc Controls Corrosion," a booklet available from the American Zinc Institute, 60 East 42nd St., New York 17, N. Y., describes the ways zinc lengthens the life of steel products, and reduces maintenance costs. Corrosion-control characteristics of zinc coatings, zinc pigments, and zinc anodes are discussed.

86. Baking Ovens

Information on Pan-L-Heat Ovens is given in a brochure which may be obtained from Jensen Specialties, Inc., 9356 Freeland Ave., Detroit 28, Mich.

87. Rustproofing Compound

Advantageous features of Irco 66 Rustproofing Compound, which is said to operate efficiently at high or low temperatures with little maintenance, are pointed out in a folder obtainable from the International Rustproof Corp., 12507 Plover Ave., Cleveland 7, Ohio.

88. Automated Ultrasonic Cleaning Machine

A reprint of an article describing a huge ultrasonic cleaning machine used by an automobile manufacturer in processing automotive parts is available from the Circo Equipment Co., 128 Central Ave., Clark (Rahway), N. J.

89. Bright Nickel Process

Improved features of Udylite Bright Nickel Process 514 are discussed in a bulletin available from the Udylite Corp., Detroit 11, Mich.

90. Sandblast Machines

Bulletin No. 1555, available from Leiman Bros., Inc., 102 Christie St., Newark 5, N. J., illustrates and describes Leiman Sandblast Machines, including standard cabinet type, upshot type, portable tank type, automatic type with rotating basket inside cabinet, portable blast nozzle type for large pieces and bench type cabinet model for laboratory and small shop use.

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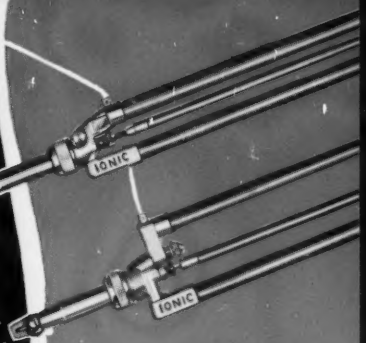

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